



AGRICULTURAL RESEARCH INSTITUTE
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Journal of Agriculture
AND
Industry.

312136
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THE
JOURNAL OF AGRICULTURE
AND
INDUSTRY
OF
SOUTH AUSTRALIA.

ISSUED UNDER THE DIRECTION OF THE HON. MINISTERS OF
AGRICULTURE AND INDUSTRY.

AGRICULTURAL EDITOR, A. MOLINEUX, F.L.S., F.R.H.S.,
GENERAL SECRETARY AGRICULTURAL BUREAU.

INDUSTRIAL EDITOR, J. BANNIGAN,
INSPECTOR OF FACTORIES.

Vol. V.—August, 1901, to July, 1902.

ADELAIDE :
By Authority : C. E. BRISTOW, GOVERNMENT PRINTER.

1902.

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Journal of Agriculture

AND

Industry.

No. 1. REGISTERED AS]

AUGUST, 1901.

[A NEWSPAPER.

VOL. V.

NOTES AND COMMENTS.

In the Lower North and South the past month has been cool and showery, with occasional good soaking showers. The month ended with splendid general rains throughout the greater part of the wheat-growing areas, with record falls of snow on the highlands. The very cold weather has resulted in heavy losses of lambs, and has also retarded the growth of feed. The outside wheat areas have again failed to receive more than a sprinkle of rain, and the prospects for the settlers in these districts are very unfavorable. There is in many parts no feed of any description, and the crops are only just above ground. Without good soaking rains and cool showery weather, a very poor crop is the best that selectors can hope for. In some of the pastoral districts good rain has fallen, but heavy losses from ravages of wild dogs are reported. Over the rest of the State the prospects are more favorable.

The discovery of phosphatic deposits of high grade on Northern Yorke's Peninsula is reported from two localities, and very satisfactory analyses of samples are furnished. One lot assayed over 85 per cent., and a second over 75 per cent. of phosphate of lime, while from a different portion of the Peninsula a sample analysing 36 per cent. of phosphate of lime has been received. These results will doubtless encourage prospectors in their search for further deposits. There appears no reason why in the near future South Australia should not become a producer of mineral phosphates. Whether it can be produced at a price that will allow local manufacturers of superphosphate to sell at a lower price than the imported super. will of course depend upon the quality of the deposit, the distance from railway or shipping port, and the cost of raising the material. The possibility of supplying the manufacturers in the adjoining States will also depend entirely upon these factors.

The Governments of Canada and Nova Scotia are paying considerable attention to the development of the producing interests. Considerable sums of money are being spent in fostering the farming, fruit-growing, and dairying industries, and arrangements are made with the railways and steamship companies to afford facilities for the transport of perishable products. In Nova Scotia last season an Act was passed with a view to assisting the dairying

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industry specially; £1,500 annually is to be appropriated for a dairy school and to aid in the equipment of factories. Model orchards of six acres in extent are to be established in various parts for experimental purposes. In Ontario £15,000 per year for three years is to be devoted to bonuses to assist in establishing the beet sugar industry, while all the required machinery is to be admitted free of duty.

Professor L. O. Howard, entomologist to the U.S.A. Department of Agriculture, has for several years devoted much time to studying the mosquito and methods of eradication. The possibility of any effective action to lessen the number of mosquitos was, and is still held up to ridicule by many wiseacres, who suggest that the destruction of all flies should also be taken in hand. Experiments upon an extended scale have, it is reported, been carried out by individuals and municipalities with such satisfactory results that in one city penalties are enforced for the non-treatment of the breeding places of mosquitos. In the army regulations during the Cuban campaign elaborate provisions were made for freeing camping places and barracks of the insects with marked success. The means of prevention are first to fill up or drain pools, ponds, and swamps where the insects breed; second, to apply a coat of kerosene oil to water supplies not required for watering stock or breeding fish; and third, to introduce in all unprotected waters, such as mill-ponds, dams, &c., the natural enemies of the mosquito, especially sun-fish and sticklebacks, that feed upon the eggs and larvæ of the insect. With regard to the common house fly, it has been proved to be quite easy to prevent their multiplication. Close attention to the manure from stables and other sources of production or breeding, is the remedy adopted.

The New South Wales Government has fitted up an elevator for the purpose of loading wheat in bulk to test the system. The s.s. *Persic*, of the White Star line, takes 1,200 tons in bulk, and the elevator was guaranteed to load 50 tons an hour, whereas it is stated by the Sydney papers that under the old system of shipping in bags it would take three weeks to put 1,200 tons of wheat aboard a vessel in Sydney Harbor. The editor, believing that Port Adelaide could do much better work than this, communicated with a prominent miller on the matter, and that gentleman states that the usual rate of loading bagged wheat into steamers at Port Adelaide, working one hatch only and one gang of men, is 25 tons per hour; but the principal stevedoring firm is prepared to *guarantee* to put 50 tons per hour into one hatch on any steamers which can work two gangs to the hatch. It would appear, therefore, that Port Adelaide is considerably ahead of Sydney Harbor in its facilities for handling wheat, and that an elevator to load 50 tons per hour would not load ships any quicker than bagged wheat can be loaded.

We have published from time to time a considerable amount of information concerning the attention paid to the cultivation of Australian saltbushes in California and South Africa, where these plants have proved of immense benefit, particularly on alkali soils. Now there is a complaint in a prominent Californian paper from a landowner that the saltbush grows luxuriantly, seeds freely, and is spreading rapidly, while neither horses nor cattle will touch it; in fact, he urges that steps be taken to prevent the further spread of the weed. Probably the variety of saltbush referred to is *Atriplex semibaccata*, as this appears

to have been most successful in California. This is the first time that the plant has been the recipient of such sweeping condemnation, but it will not come as a surprise to stockmen in Australia that stock refuse to eat it. With this, as with other valuable forage plants, it is not unusual for stock to refuse to eat it until they become used to the taste of the plant.

In some of the fruit-growing districts of Tasmania the growers are agitating for legislation to compel manufacturers of jams and jellies to accurately describe on the tins or packages the contents of such packages. It is freely stated that some so-called "black currant jam" consists of eight parts of plum and two parts of black currants. Similar adulteration is said to be practised in respect to raspberry jam. Wonder is expressed in other quarters at the possible uses of loads of turnips, pumpkins, mangolds, and the like to be seen sometimes at jam factories during the busy season. The sale as vinegar of "wood acetic acid" is another instance of the necessity for legislation to compel manufacturers and dealers to supply customers with correctly described goods.

In the United States the question of food adulteration has received very great attention. Some of the most prominent authorities there condemn in unmeasured terms the use of various coal-tar dyes to disguise the adulteration that is practised. At a recent meeting of one of the associations of chemists samples of cloth dyed in various colors were exhibited, and it was explained that the dyes used were obtained from samples of jams, jellies, fruit-preserves, and other foods sent to the State laboratory for analysis. It was pointed out that many of the dyes used contained properties which in only moderate quantities were injurious to the health of consumers. In some "raspberry jam," which contained an exceedingly low percentage of raspberry pulp, various small seeds, including Timothy grass, have been found. No one would buy a tin containing, we will say, turnips, grass seeds, aniline dye, and essence of raspberry if the label accurately described the contents. To allow the sale of this is therefore to tacitly allow the whole community to be defrauded by a few unscrupulous manufacturers.

Bricks of fruit pulp, pressed solid and packed in paraffined paper, are now put upon the markets of the world by French and American manufacturers. The fruit is without sugar, boiled down to a very thick consistency, and includes, amongst others, raspberry, strawberry, currant, gooseberry, plum, quince, peach, apple, and pineapple. Several housewives in South Australia are in the habit of boiling down fruit to a thick paste, and a few have learned that it helps to condense the fruit by adding a very little clear wattle gum; but no one here has ever thought to manufacture two-pound bricks of jam for sale in the shops.

With respect to the importation of fruit trees, the *Western Mail* (West Australia) says:—"During the first three weeks of June the returns of the importation of fruit trees constituted almost a record for this State. During the period under review, 53,089 trees and plants were imported. Of these, 33,062 were apple trees. For the month of May, 3,405 fruit trees were imported, of which 530 were apple, making a total of 33,592 apple trees for this season. The annual importation of apple trees alone for the previous five

years was as follows:—1896, 44,520; 1897, 14,862; 1898, 7,315; 1899, 36,920; 1900, 34,301. These totals, together with this season's importations, make a grand total of 171,510 apple trees, which, when planted, will, it is stated, cover an area of 1,715 acres. These figures do not include the trees, amounting to several thousands, obtained from the local nurseries."

There is no knowledge more precious than that bought by experience, and yet there are many farmers who fail to profit from experience. A few of them have been enabled to feed their live stock during two or three years of drought on fodder saved when there was abundance of feed. Pharaoh, of old, kept his subjects for seven years on the saved food of the seven previous years of plenty, whilst all adjacent nations suffered from famine. Australian pastoralists and farmers have been ruined through the starvation of their stock, whilst in years previously their animals were not sufficiently numerous to eat a tithe of the fodder produced naturally. Farmers have burned or wasted all their straw, and left no end of feed to dry and waste and rot upon the land one year, and next year have unroofed their sheds and houses to feed their starved stock. The time to make hay is "when the sun shines"; the time to provide against drought and scarcity of feed is "when there is anything in the form of feed to be gathered up."

Some straw can always be fed to horses, the quantity varying with the work and the purpose for which the animal is used. Idle horses, having ample time for masticating and digesting their feed, can subsist almost wholly on good bright straw; hard-worked animals, and those required to move rapidly, can make use of only a little; the feeder must judge from the conditions how much to supply. It is a notable fact that many horses are fed costly hay for roughage, when cheaper straw or fodder corn would prove equally satisfactory. In relative value for horse feeding, the straw ranks in the following order:—Oat, barley, wheat, rye, the last named being of slight utility.

The *Australasian Pastoralist's Review* states that the New Zealand Dairy Association, Auckland, manufactured during the past twelve months over 1,200 tons of butter. In 1894 the total value of the dairy produce exported from New Zealand was £423,627. In 1899 it had more than doubled, and last season it reached the sum of £1,031,583. Those financially interested evidently see promise of future expansion, as a number of companies are making arrangements to handle increased supplies during the coming season. South Australia imports considerable quantities of bulk butter of high quality from New Zealand during our off season.

For several years past the Belgium hare "craze" has been increasing throughout the United States of America, and most absurd prices were paid for "so-called" high grade breeding stock, £100 being a not uncommon price, while nearly ten times that amount is reported to have been paid for one or two animals. It is now stated, however, that the craze is passing, and that breeders are turning them loose in different parts of the country, as the prices obtainable do not pay for feeding. Those interested in pastoral affairs view this with some alarm, it being feared that, notwithstanding the country is not so well adapted as Australia, our experience with rabbits may be repeated. This so-called Belgium hare is stated to be merely the red English rabbit improved by selection.

Every farmer who keeps cows or any kind of live stock should cultivate a few acres of his fallow each year with some kind of sorghum or holcus. The land upon which the crop is grown will generally produce a heavier cereal crop than adjacent land that has not been used for growing the fodder crop—more certainly if a good lot of farmyard stuff has been put on. It has been argued that the sorghum abstracts the moisture from the land when the summer is dry; but this is very doubtful, and it is well worthy of experiment. It is more likely that the green crop adds to the fertility of the soil, conserves its moisture, and prevents waste of its humus or organic constituents.

According to a bulletin recently prepared by the United States Department of Agriculture, there are estimated to be 400,000 Angora goats in the United States, and the annual production of mohair is about 1,000,000lbs. Angora goats are being extensively bred in the Western States and territories, especially in Texas, New Mexico, Nevada, Florida, California, and Oregon. Their usefulness is manifested in various ways. The fleece called "mohair" furnishes some of the finest fabrics, and is used in various other manufactures. Their flesh is exceedingly delicate and nutritious; the milk, though not so abundant as with the milk breed of goats, is richer than cow's milk; their tanned skins, though inferior in quality to the skins of the common goat, are used for leather; their pelts make the neatest of rugs and robes. A few of them in a flock of sheep are a protection from wolves and dogs.

Some of the American Experiment Stations have discovered that a small quantity of dried blood in the food of weak and thriftless calves has an extraordinary good effect. At Manhattan, a calf seventy-nine days old weighed only 90lbs., or 4lbs. heavier than at birth. He was given castor oil, laudanum, fresh eggs, and calf meal successively in vain; then dried blood was mixed with his food, and at the end of the year he weighed 578lbs., and made nearly 14lbs. per week. During part of three months the dried blood consumed weighed 7½lbs., costing 7½d. It has been found that dried blood is an excellent remedy for scour in calves. One teaspoonful of dried blood in a feed is great plenty, and should be continued until the scour disappears. When feeding a weak calf, the quantity may be gradually increased to one tablespoonful at a feed. The blood should be thoroughly mixed, and kept stirred until the calf begins to drink the milk. [The blood should be free from tubercle germs.—ED.]

Many years ago a butcher in Adelaide had a kicking horse. The brute would kick the bar at the back of his stall, kick the vehicle that he was drawing, and kick at everything in creation on every opportunity. The butcher determined to give his horse a treat, so he tied him in the stall, stuffed a strong flour bag tightly with straw, strengthened it with more bagging, and then hung it by the top to the rafters so that the bag reached his hocks. The horse kicked and kicked, every kick bringing an assault from the bag upon his binder quarters, until, after about twelve hours of hard kicking the horse gave "best" to the bag, and ever afterwards swore off kicking at anything whatever.

THE LATE MR. SAMUEL GOODE.

On July 26 Mr. Samuel Goode died, aged 82, and South Australia lost a good and true man. He was a member of the Central Agricultural Bureau almost from its first inception, and was one of the most experienced and practical farmers in the State, having for many years conducted farming in England, where he bred some of the most famous Hereford cattle of the time, which were eagerly bought by the breeders in America as well as by the most prominent breeders in the United Kingdom of Great Britain. He also carried on farming for many years in South Australia. Mr. Goode was a member and was on the agricultural committee of the Royal Agricultural Society, and for a time occupied the position of President. Whether in England or in Australia, the deceased gentleman always gained the love and admiration of all who met him, and municipal and other honors were continually being proffered, and were sometimes accepted. His career has been a most useful one, and he has well earned the rest that awaits every "good and faithful servant."

INSPECTION OF FRUIT AND PLANTS.

With the opening of the West Australian market for our apples and pears, and the development of the export trade generally, there has been a large increase in the work of inspection, and a consequent increase in the expenditure. The Hon. Minister of Agriculture has therefore decided that any person desiring the services of any inspector will be required to pay for such services. In the past no charge has been made, but it is felt that it is only fair that the section of the community directly benefiting from the services of the inspectors should contribute towards their salaries and other expenses, instead of the amount being all paid from the public funds. Between 9 a.m. and 5 p.m. a charge of 1s. 6d. per hour will be made for the services of any inspector engaged in inspecting fruit or plants exported from or imported into South Australia. Where plants or fruits imported into the State require to be fumigated, a charge to cover cost of inspection and fumigation will be made. For wrapped fruits the charge will be 8d. per bushel, and for unwrapped fruit 6d. per bushel, to cover also cost of repacking. With plants the charges will be as under:—For twenty-five plants, 1s.; for fifty plants, 1s. 6d.; and for each additional fifty plants, 6d. extra. The importers will also have to pay for conveying packages to and from the fumigating chamber. With small plants, such as fruit-tree cuttings or stocks, hedge plants, nursery stock, &c., a lower rate, according to the size of the packages, will be made on quantities of more than 400.

WHAT IS A VINTAGE WINE?

Mr. E. Burney Young, "Commercial Representative, South Australian Government," London, writing to the *Times* on the subject of the vintage of Australia, refers to the unexpected heavy vintage of 1901, following the severe frosts of 1900, which had made havoc of the vintage of that year, and then goes on to say that, through the instrumentality of the *dépôt* established in London by the South Australian Government, Australian growers have been able to market the vintage wines of Australia. He then goes on to remark that "the average consumer probably understands nothing whatever of the difference between a vintage wine and a blended wine. The advantage of blending the wines of different years and many vineyards is that the merchant is able to offer

a continuous supply of a wine of uniform character, irrespective of the character of any particular vintage. He makes a standard, and by using care he can always follow it so closely that no difference would be detected, except, perhaps, by careful comparisons by an expert taster. But blending has its reverse side. It is impossible, however expert a blender may be, to attain the same standard of quality—of individual excellency—as a purely vintage wine. The disadvantage from a merchant's point of view in marketing vintage wines is that vintages sometimes vary in character, so that he is not quite certain of being able always to offer an exactly uniform wine. This variation applies in an infinitely less degree to Australian wines than to those of European growth, as the climatic changes are far less extreme in Australia. For instance, there never has been known a vintage to be defective from too much wet or from want of sufficient sunshine to mature the grape. But the general public look for an absolutely uniform article in Australian wines, and therefore blending has been resorted to and the vintages are submerged. If, therefore, the growers of Australia, in sending their wines to the Government dépôt, are at any disadvantage through their wines not being blended, they are amply compensated, as by offering the pure vintage wines a large number of first-rate clubs, hotels, and restaurants who hitherto had never used Australian wines have now adopted them—a distinct advance in the career of the Australian wine trade.”

MILDURA NOTES.

The long drought, which still continues unbroken along the Murray channel, has left its withering mark even within the irrigation area of Mildura.

The condition of farmers and selectors along the Lower Darling and Murray rivers, and more especially of those without a river frontage, has naturally been seriously affected by the lack of rain; but it might be supposed that such a settlement as this, with its elaborate arrangements for water distribution, would be entirely independent of the natural rainfall. Such a consummation may be reached some day, when the revenue of the water trust has overtaken its expenditure; but we are not there yet.

The weather during the raisin-drying was ideal, but it lost its ideality when the last of the dried fruit was safely housed and the rain still remained in suspension. The necessity for a winter watering is not generally anticipated, and the pumping plants and gear had been all dismantled immediately after the last watering of the season, in order to allow of a thorough cleaning and overhauling of the machinery. The last pumping—designed mainly for citrus stock—is not always availed of by growers, owing to its occurrence in the midst of the busy time of raisin-drying, and the citrus orchards so neglected have suffered severely this winter, as also have some not so neglected. Water-carting from the town for domestic purposes has been fairly general throughout the winter, and some citrus growers have even carted for their trees. But for the dismantling of the pumps we should probably have had a winter watering some time ago, but settlers object now to paying for an extra watering proposed for the beginning of July, as it is too late to help this season's citrus crop, and vine-pruning is still in full swing. A domestic supply will therefore be run round the channels during the first week in July, and the first regular pumping of the season will be made early in August, instead of in September or October, as is the usual practice.

The lemon crop is rather light, and in many instances the fruit is undersized, through lack of moisture. Much of it has been sold to local buyers at prices considerably below those of previous years, and a feeling of general uncertainty regarding probable returns for the season prevails. The river has only now, at

the end of June, risen sufficiently for the regular running of boats, and the Melbourne market is not yet properly tested, though the large quantities dispatched with the first few boats will doubtless cause a slump in prices, more or less temporary. The dry weather and absence of early frosts are excellent omens of success for those who have picked for purpose of curing.

The question of introducing the American phylloxera-proof vine stocks into this settlement came into prominence some months ago, and is still being discussed in a desultory fashion. As it was understood that individual settlers were applying to the State Department for rooted vines of resistant varieties, the local Horticultural Society took the matter into consideration, and decided to oppose any premature introduction of American stock, taking its arguments mainly from the report presented to the South Australian Government by that colony's delegates to the Intercolonial Phylloxera Conference, and also from articles by Professor Perkins. A letter was sent to the Department of Agriculture, setting forth the danger of possible introduction of phylloxera along with the resistant stocks, and urging that individual settlers of this settlement should not be supplied with the American vines so long as the district remained free from the disease. In this action the society was supported by the *Cultivator*, but the case for the immediate introduction of the "proof" vines has been several times presented to *Cultivator* readers by Mr. Tod Mercer, formerly of Mildura, and now resident in Italy. From personal observation in parts where the American vines have been successfully grown, this gentleman has become strongly impressed with the advantages derivable from their use. The danger of the development of the winged gall form of the phylloxera on the American vine leaves, and the consequent rapid spreading of the pest to non-affected areas, is admitted; but it is contended that disinfection of imported cuttings can be made absolutely thorough and certain. It will be difficult to get united action on the matter by Mildura settlers, and it would probably be found very difficult to isolate this district from communication with infected areas in Victoria, even if local authorities were inclined to take vigorous action in the matter, which inclination is not at present observable. Meanwhile the area under vines, especially Sultanas, is being rapidly extended, and with it, of course, there is increased the certainty of resultant loss to the district when the phylloxera does come. The latest contribution to the *Cultivator* controversy is from the pen of an Italian, Professor A. Vivenza, and he speaks with some show of authority on the subject, which supports Mr. Mercer's contention.

The Mildura Horticultural Society is not as well supported as might reasonably be expected in such a settlement as this, and is kept in existence mainly by the efforts of a few devoted office bearers. Settlers are inveigled into joining mainly by means of an annual ball, and by scratch concerts and suppers throughout the winter months, as an incidental to which original papers are read on various aspects of horticultural life. This season the little suppers and papers have lapsed, and a series of Saturday afternoon field demonstrations has taken their place. Afternoons devoted to apricot pruning and citrus culture were not very successful, but the existence of the Sultana boom was plainly visible in the interest taken in a Sultana pruning demonstration on the 15th July.

The annual July Citrus Show was fairly successful—better than last year—but still not as good as should rightly be expected from such a settlement as Mildura. The drought has, of course, affected the quality of citrus fruit this season, but in this department there was still a very creditable display. In the dried fruits department, however, which is really more important to us than the citrus, entries were not numerous. Colonel Morant, of Renmark, carried off the society's cup trophy with an excellently-packed display of dried fruits. There was no single competitor in this line from Mildura. This is partly accounted for by the fact that settlers here have everywhere specialised on a

few lines, and very few are in a position to show a large assortment of their own growing, drying, and packing such as the conditions of competition in this entry demand. The Fruitgrowers' Association tabled a magnificent display of dried fruits, but not for competition. With his usual enterprise, the secretary of the association, Mr. Fred Hawkes, is sending a portion of this exhibit to London, other portions to Victorian country shows—these latter to be eventually collected and shown in Melbourne.

Good work is done by the Horticultural Committee at our shows, and it is hoped that the friendly rivalry of your South Australian irrigation settlement will tend to awaken our fruitgrowers from their regrettable apathy in the matter of exhibiting.

The Sultana boom continues unabated this season, and the area of these vines is being considerably extended. The prospect of good prices for currants, owing to the havoc worked in Greece, is leading to increased interest in Zante cultivation, but settlers are cautious about planting, owing to the uncertain yields of this grape during the early years of growth. In regard to the pruning of this vine, the opinion was freely expressed at a field demonstration, arranged by the Horticultural Society, that it has been the custom here to leave too much wood on the vine. Short spur pruning, from one or two rods trellised along a wire of medium height, with one wire below, seems to find most favor. The old trellises here are mostly very high, with three or four wires, and during the demonstration Mr. McEachern explained that he had last year secured phenomenal results from a small area by arching the vines from trellis to trellis across the rows, at a height sufficient to work horses underneath for ploughing and cultivating.

A few are experimenting with ring-barking, but no definite results are yet forthcoming.

Manuring, especially among vines, is being extensively practised.

The Fruitgrowers' Association is disposing of numerous copies of Mr. Quinn's booklet on pruning, which is much appreciated here.

The citrus market is in a deplorable condition, and the uncertainty occasioned by the expected advent of intercolonial freetrade has retarded sales of dried fruits. Business in these lines is slackier than for years, but there is nevertheless a considerable amount of planting going on. Many abandoned blocks are being prepared afresh, and a good deal of new ground is being broken up.

We have had no rain this winter, and ploughing in the heavy grounds is very difficult, many settlers postponing this operation till after the first watering, which is arranged to begin on the 1st of August.

Unprecedented frosts, combined with the dryness of the soil, have told hard on the citrus crops in places.

TRANSPLANTING OLD FRUIT TREES.

Mr. George Monks, Forest Range, writes that he successfully transplanted thirty fruit trees nine years old. He first cut back all the main branches to about 12in. and all the roots to about the same length, had the holes all ready, dug out the trees, lifted each one on to an opened-out wheat bag, which he wrapped and tied around the remaining roots and soil, so as to retain as much as possible of the soil about the roots during transit, and then replanted them in their new position. He has known of older trees being transplanted with much success. When the limbs and roots have been thus reduced the removal from one position to another scarcely interferes with the growth, and if the removal is effected early the fibrous roots will rapidly develop, and growth of the branches will soon be luxuriant. Mr. Monks does not agree with the member of Holder Branch who recommends to procure young trees from a nursery in preference to transplanting four-year-old trees.

ORCHARD NOTES FOR AUGUST.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

Those orchardists who have ploughed early and thrown the soil away from the tree stems will, in the early districts, now see the need for a second ploughing to bring the soil again into its usual position. A shallow furrow which will effectively bury any weeds, and not turn a deep layer of moisture-laden soil up to the sun, has been found most valuable.

If no ploughing has been given until now, it can scarcely be considered wise to turn the land with a deep furrow, as this only aids in dissipating the all too limited moisture in the soil.

In such early districts it is advisable to put the cultivator into the ground immediately after this ploughing. If any delay occurs the cloddy soil may become baked, and its pulverisation made very difficult or impossible, just according to the texture of ground in such a locality. Rather than plough late and omit the scarifying the surface had better remain in unbroken sod. The rough baked fallow sometimes seen in our orchards during the summer most assuredly assists the rapid dissipation of soil moisture into the air rather than retain it in the ground. The retention of soil moisture in its capillary form is without doubt the chief object of cultivation in this climate. The killing of weeds is of secondary importance to it, and the freeing of plant food dependent to a very great extent upon its successful consummation.

The planting and pruning of deciduous fruit trees will be concluded with this month. There is a distinct advantage in pruning peach and nectarine trees late. It consists in the fact that many flower buds drop off the shoots of these kinds late in winter, and early-pruned trees may prove to have a scanty supply of blooms left when the flowering time arrives.

Apricot spurs can also be much more accurately and expeditiously dealt with when the scales of the wood buds show a distinctly grey appearance. In those portions of the State best suited to the growth of citrus fruits of high quality, this is the best month to transplant these trees. The best indication of when the temperature of the soil is rising is seen in the plants themselves. When the buds in the axils of the leaves begin to peep out as pale green points, that is the time to remove them. If left until these emerge into soft shoots an inch or two long, a considerable injury must result. The intimate connection between the feeding roots which are broken or wilted in the shifting, will most certainly cause them to wither away also. The safest way to shift a citrus tree is to take it up with the original unbroken ball of earth adhering around the roots. To approach this ideal the trees must not be large or deeply rooted, but possessed of plenty of fibrous roots. Those raised in a rather shallow soil possessing a fair percentage of clay, will answer these requirements better than others reared in a deep sandy spot where the roots are naturally encouraged to descend deeply. In other words, the soil and subsoil most favorable to the longevity of citrus trees is not the ideal spot on which to raise trees for transplanting. Large trees must almost of necessity lose a greater portion of their roots in the lifting. When planting, the tops of such should be reduced in proportion to their root systems. This is patent to anyone who considers that the transpiration of moisture is greater from a large leafage than from a reduced quantity. When the absorbing power of the roots has been curtailed the supply of moisture cannot be kept up, and the plant suffers accordingly. Practical demonstration has proved that citrus trees remain more free of the "collar" disease when the crown of the roots is at the surface of the soil. To attain this (when shrinkage has taken place) the trees should be set so that the crown of the roots is slightly *above* the surrounding surface. Beginners will do

well to be warned against planting citrus trees (1) in open exposed positions; (2) in badly-drained heavy soils; (3) where insufficient quantities of good water are available for irrigation in summer; (4) where severe frosts occur. Every person who plants a dozen citrus trees should have one Poorman or bitter orange amongst them for the production of preserves for his own household purposes. The surplus fruit can always be readily disposed of to the neighbor who grows none, but likes preserves.

If scions for grafting are not yet secured, no time should be lost in obtaining them. It is scarcely necessary to say they are readily preserved until required by being buried in moist (not sodden) sand or soil.

The treatment of trees for various insect and fungus pests will begin in earnest now. The black aphid of the peach is already beginning to appear in bunches *on the underneath side of the flowering shoots*, and they should receive attention ere the leaves emerge. The best all-round spray is made by boiling 2ozs. strong tobacco and 4ozs. common soap in 1gall. of water. To ensure success, the spraying should be done thoroughly, and repeated several times at intervals of a couple of days. This remedy, it must be understood, *kills by contact only*, and therefore must be brought in direct contact with the insects. Last year, in conjunction with one of our peach growers, I fumigated a number of large trees by enclosing them in a twill bell-shaped tent, and using tobacco and cyanide fumes respectively. The results were very gratifying, and proved quite harmless to the trees. Trees in codlin moth infested orchards could be cleaned off of dry, cracked bark, and knotholes or broken ends could be cleaned or sawn off to avoid harboring the caterpillars.

Fruit stores should also be closed or overhauled when the apples and pears are all removed. If airtight, a good sulphur fumigation will be found useful. If the windows can be made mothtight the escape of many codlin moths may be averted by closing the house securely.

The spraying of trees for the prevention of fungus diseases will begin now with the peach and nectarine. These are treated with Bordeaux mixture to avoid attacks of the curl leaf fungus (*Exoascus deformans*). The trees should be thoroughly drenched from the top buds to the base of the stem with Bordeaux mixture.

A good formula for making this is composed of the following proportions:—

1lb. bluestone,
1lb. fresh lime,
5galls. water.

The bluestone is dissolved with boiling water, and the lime is slaked, and the two mixed together immediately prior to being applied. *This is a winter formula*, and must be weakened considerably if applied after the leaves appear. The best time to apply Bordeaux mixture is on a fine calm day, just when the buds are opening, i.e., when the color of the petals can be seen in the buds.

This remedy is also effective under such conditions when applied to the apricot for the shothole fungus, which also causes the scabs on the fruits; the apple and pear for blackspot or fusicladium; and the almond, cherry, and plum for shothole in leaves. In wet localities the adhesiveness of the above mixture is much improved by the inclusion of treacle in equal proportion to the bluestone and lime.

PREVENTION OF WEEVILS IN SKINS.—Morehead, Limited, publish the following recipe with their last report, which should interest the kangaroo-shooter:—"Solution of Arsenic for the Prevention of Weevils in Skins.—Mix 5lbs. arsenic and 6lbs. soda in 10galls. of water; boil slowly for about half an hour, and when the mixture rises dilute with twice the quantity of cold water. Apply with a brush to the fleshy side as soon after flaying as possible."

GRAFTING FRUIT TREES.

A LESSON FOR BEGINNERS.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

Grafting may be described as the operation of inserting a scion—a twig comprising one or more buds—into a stock, which possesses or consists entirely of a root system ready and capable for absorbing moisture and nourishment.

The scion is usually, but not always, inserted into an incision made in the wood. The chief object of grafting is to change an undesirable variety into one that is more valuable for the purpose in view. By means of grafting a return can be obtained in a lesser time than would be possible by planting a young tree. It is superior to a seedling in that a graft reproduces all the characteristics of the parent tree. With the exception of a cutting, it is the only known method by which an exact counterpart of the original plant can be obtained with certainty. It also enables the grower to increase or diminish the robustness of growth by using stocks suitable for either purpose. By grafting scions from them upon older stocks seedlings may be fruited, and thus tested much quicker than otherwise, and by the selection of certain resistant stocks the injuries of various insect pests may be avoided.

There are many methods of grafting, and endless modifications of these, but the cardinal principle to be observed is the same in all. To effect a union of scion and stock the sap-carrying layers of tissue—technically known as the cambium layers, which are located just beneath the bark—must be pressed in close contact, to the exclusion of the air and all other substances.

It is not essential that these layers should meet exactly all the way around the cut surfaces of both scion and stock, but it should be carefully observed that the greater area of cambium on each which can be brought in contact the more certain and rapid will be the complete fusion of the tissues of stock and scion. It is the observance of this general principle which has caused so many methods to be devised for adjusting the scions and stocks, for experience has taught that it is only in these cambium layers that union takes place. The woody fibres do not unite. It is important to note this, as the presence of a dead or inert substance within the heartwood of a tree, even when the wounds of grafting have healed to all outward appearances, is certainly a source of weakness and menace to the stability of the trees. With a knowledge of this the operator should always select that form of graftage which does not leave a large quantity of this inert matter attached to the scion, or wound the stock unnecessarily in making the incision to hold the scion. The scions should consist of growths of the previous year. They must be well ripened and fibrous, not brittle and pithy. To avoid the latter defect the few buds at the top of the shoot should be discarded. The scions must be cut in the winter, or before the buds swell in spring. Only scions from trees known to be good regular croppers should be used. The scions are preserved best if buried in moist—not sodden—sand, in a cool shady place, as it is desirable to retain them in a dormant state.

The stocks may be roots, young plants, or old trees. These are not prepared in any way until the time arrives for manipulating them and inserting the scions. By this it is intended that roots shall not be dug or tops cut off trees until they are to be worked. Root-grafting (as shown in Plate I.) is usually performed while the stock and scion are still dormant in late winter. Grafts made above ground are completed, as a rule, in early spring, just when the sap starts to move in the trees (these are represented by Plates II., III., and IV.). Bark grafts can only be inserted when the sap is sufficiently abundant to

permit the bark and wood separating readily, as is required in budding, or bud-grafting. Plate V. illustrates this section.

Grafting, as dealt with in this article, is usually applied to the propagation or renovation of apple, pear, plum, and olive trees. Stone fruits are invariably budded, although the methods described herein may be safely used on them when absolutely necessary. Citrus fruits are also bud-grafted.

Excepting in the case of quince stocks when used for dwarfing pears, it is always advisable to work each sort upon stocks of its own kind, viz., plum on plum, pear on pear, and apple on apple.

To exclude the dry atmosphere and all foreign substances from the point of union or contact of cambium layers, and prevent the drying up of the sap at this section, a coating of some adhesive substance is necessary upon all grafts made above ground. A rude grafting wax or paste can be made of two parts clay, one part cow manure, and a little hair. The former ingredients are pulverised and worked into a plastic condition by the addition of water, the hair being finally incorporated. A thick coating of this will give fair results if only one or two trees are to be grafted, but in commercial work it is now discarded and replaced by waxes, which are less bulky, less liable to crack or be washed off, and more readily manipulated. The waxes are chiefly composed of resin, beeswax, and tallow. The following is an approved compound:—Resin, 3lbs.; beeswax, 2lbs.; tallow, 1½lbs.; turpentine, 4ozs. These ingredients are broken into fine particles, melted together over a fire, the turpentine added afterwards, and are then ready for use; but care must be exercised in applying hot waxes to the tender bark of a bark-grafted stock, such as the olive. For this reason some of the alcoholic waxes are preferable on soft bark. Lefort's liquid grafting wax is given here as in Professor Bailey's book:—Resin, 1lb.; beef tallow, 1oz.: dissolve over fire, and when dissolved remove from fire and add 8ozs. alcohol. Keep in close-stoppered bottles or tins.

When waxes are applied hot a brush is used, but when bandages are applied to small stocks the bandages or cotton wicks are saturated in the hot wax and wrapped on, remaining in its position without a tie. The ball of wick cotton may be put in the hot wax and saturated prior to being used, or the narrow strips of calico can be wound around a stick and thrust into the liquid wax in a similar manner and be unwound as required. The tools used for the work, of course, are variable. Besides a saw, a good broad chisel, and a mallet for large cleft grafts, a strong sharp pruning knife will do for the purposes of cutting scions and making incisions in all small stocks.

Explanations of the Plates.

PLATE I.—Fig 1 shows the prepared stock and scion, the former consisting of a piece of root about 4in. long and the thickness of a pen handle. Above it stands the scion, a piece of twig about 6in. or 8in. long. These are desirable lengths. The top of the root (stock) and base of the scion are cut off obliquely, showing a section which may be from ¾in. to 1½in. long. About one-third of the length—from the top of this section in the stock—a downward slit is made, and a corresponding slit made the same distance from the base of the section on the scion. When the two oblique sections are placed together as depicted in our illustration, the tongue of the stock will slip into the slit of scion, and *vice versa*. This is called a *whip and tongue graft*. A very firm mutual grip is thus obtained. This method is usually adopted when rootstock and scion are approximately of the same size, although this is not necessary if the sap layers on stock and scion meet for a fair distance along one side.

The junction is then bound around, as shown in Fig. 2, with candlewick or calico strips, or other material that will rot away pretty quickly, no waxing being necessary, as the grafts will be deeply buried in the soil.

Fig. 3 represents another method of root-grafting, the stock and scion being ready for adjustment. This method is used when there is a greater difference between the sizes of the root stock and scion. It is a very economical process, using up many small roots; in fact, pieces of roots no larger than our illustration can be utilised.

The top of the root is cut wedge shape, and a shallow upward sloping incision made in the side of the scion, just above the base; into this the root-wedge is thrust, as shown in Fig. 4, care being taken to fit the sap layers on one side at least of the stock and scion.



PLATE I.—TWO FORMS OF ROOT-GRAFTING.

The budding is done as in the other case. This latter method permits kinds inclined to root from the base of the scion to do so freely. The much-prized Northern Spy apple roots strongly in this way. The grafted plants are inserted in the soil to the depth shown by dotted line A in our illustration. This only leaves one bud above ground.

In actual practice the roots should be dug up, washed, and carried into a shed where there is a bench to work upon. They are then cut into suitable lengths, trimmed, and sorted into sizes. A sharp seccateur or keen-edged pruning knife should be used. Every precaution must be taken to keep the roots moist—wrapping in a wet bag being a simple method.

Having the roots and scions prepared on the bench the operator joins them by the method explained, and ties the joined sections.

The grafted stocks may be either planted out at once or kept for a while in damp loose sandy earth. If planted in nursery fashion the rows should be 2ft. apart, and the plants from 9in. to 12in. distant in the rows. The solitary bud left above ground is alone permitted to grow to form the future tree.

This is the method pursued to obtain blight-proof apple trees. The root and scion *both* are from a blight-proof kind—preferably Northern Spy—and after the resulting shoot has attained a sufficient thickness a bud of the variety desired is inserted, not nearer than 6in. to the surface of the soil. This height for budding is advocated to prevent adventitious roots being sent out by the budded variety, which is most likely not blight-proof. With the exception of the propagation of apple trees, root-grafting is not used to any extent in South Australia.

PLATE II. represents a graft used upon small stocks. It is a whip and tongue method, made as described formerly, and adjusted so that the cambium layers meet only upon one edge, the remainder of the stock being sloped off to assist in making a less ugly joint when healing. This is shown in Figs. 1 and 2. Fig. 3 shows the joint closely wrapped in waxed cotton wick to exclude dry air, &c. This graft is applicable to young shoots on old trees after being cut back a season, or upon young nursery stock, say up to two years' growth. It is made at any required height above ground, and effects a good union.

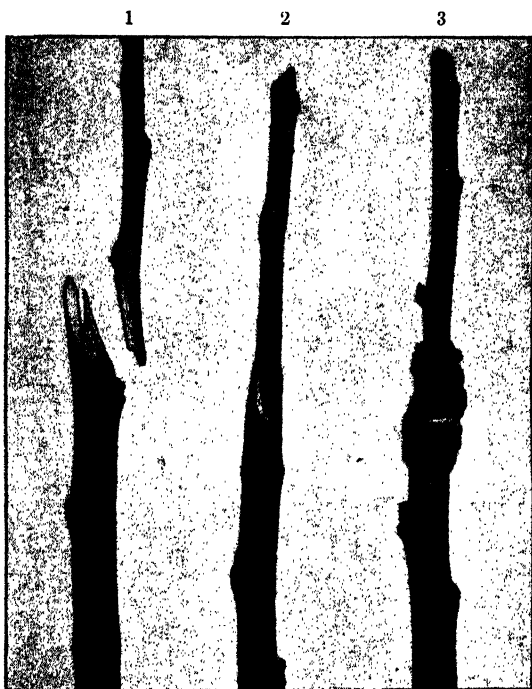


PLATE II.—NURSERY GRAFT.

PLATE III. shows a form of graftage known as a split or cleft graft, with a single scion. It is applied to stocks of about 1in. in diameter. Fig. 1 shows this scion prepared for insertion into the split in the stock. Fig. 2 depicts the stock as seen from the side opposite to the scion, and the ugly, dangerous split can be readily observed. This stock is also sloped to facilitate the healing process. Fig. 3 shows the scion inserted ready for tying. It can be seen how the barks of stock and scion are fitted. Fig. 4 represents the stock and scion fitted and tied with a waxed band. It is not a very desirable form, as the split never properly heals, though it may be overgrown.

PLATE IV. represents the split or cleft graft as commonly applied to large old stocks. Fig. 1 shows the stock as split and held open with a chisel until the scions are inserted. After the split is made, should its edges be bruised or jagged, they must be carefully trimmed and smoothed with a sharp knife.

Figs. 2 and 3 show the scion with the outward (bark) edge and the inner wedge-shaped section respectively. In Fig. 2 it will be seen that a bud is located just at the point where the section begins. Behind this bud a shoulder is made,

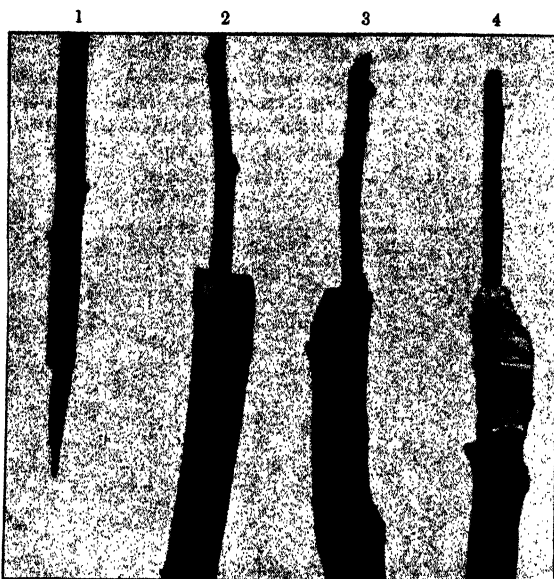


PLATE III. SPLIT OR CLEFT GRAFT.

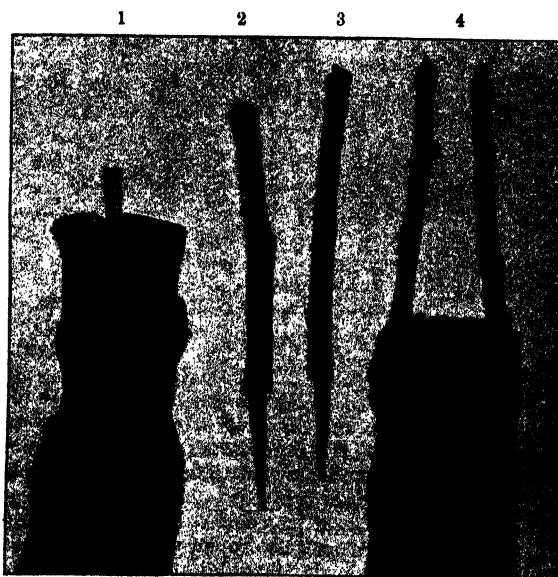


PLATE IV.—SPLIT OR CLEFT GRAFT.

which rests upon the horizontal surface of the stock when inserted in the cleft. When the scions are adjusted into position the wedge or chisel is withdrawn, and the stock closes back and clamps the scions firmly. They are then tied, and the whole cut surface, from the lowest point of the cleft section on the stock upwards, is carefully waxed to exclude dry air, moisture, and germs of decay. A good number of scions may be inserted in this manner around a large stock, but the method of split-grafting is not conducive to the best health of the tree, for the reasons advanced in respect to the last-named modification of it as applied to young stocks; in fact, in the case of a large tree stock the defects are more aggravated, and the chances of a complete healing much reduced.

PLATE V. depicts a form of bark-grafting. Fig. 1 illustrates a large stock with an incision made in the bark ready for the insertion of the scion, which is shown (Fig. 2). It will be seen that this scion is cut with a horizontal section through three-fourths of the diameter. From this point the cut is sloped away to nothing at the lowest point. From the opposite side

—that is, the bark side—a downward cut is made which makes a wedge point to the scion. A bud is located about half way down this reduced portion.

When the scion is pushed down into the incision made in the bark of the stock the shoulder rests upon the horizontal surface of the stock, and the bud upon the reduced section is about an inch below, merely projecting into the incision. The reason why the point of the scion is made wedge-shaped is because it may be pushed down into the incised stock without the bark from the base of the scion being bruised or crumpled back. This wedge-shaped point also facilitates the operation. The reason why the bud is embedded in the incision in the bark of the stock is an assurance against the work and season being lost should the top of the scion be broken away. If this does not occur the embedded bud remains dormant. After the scions are inserted a string binding is passed around them to secure them in position, and wax is

painted over the whole surface operated upon, as in the case of cleft-grafting. Fig. 3 illustrates this when completed.

Bark-grafting has many advantages over the cleft-grafting. It does not injure the stock so permanently, and makes a better union; a greater number of scions can be inserted around a large stock, and the results may be seen sooner. It is performed a little later than the other methods, and can only be done when the bark of the stock lifts readily from the wood—that is, when the sap is in active motion.

The after-care of the grafts is an important matter, and I will take them in serial rotation. Root grafts will require no loosening of the ties, but all the buds, excepting the top one, should be suppressed. If



PLATE V.—BARK GRAFT APPLIED TO
LARGE STOCKS.

it is intended to shape the trees in the nursery rows, when this shoot attains a height of 18in. it should be cut back to 12in. and a number of shoots to form the main arms of the tree will grow out. If the tree is to be budded—as in the formation of blight-proof apples—allow the shoot to grow straight up, and in the proper season insert a bud at a desired height—not less than 6in. from the ground—of the kind required.

The graft illustrated in Plate II. should retain its bandage closely for several months. All shoots below the union should be suppressed.

The cleft graft in Plate III. requires more careful attention to the binding, owing to the wounds being more severe and taking longer to heal; in fact, the sections near the union should be kept waxed or closely bound until the wounds are healed over completely.

In Plate IV. the cleft graft upon an old or large stock requires still more

careful and lengthy attention. All shoots which grow from the stock below the union should be restricted by pinching out their growing points, and they must never stand higher than the growths from the inserted scions. They are not removed because a large root system remains below the ground to be kept active. If not sufficient vent is allowed on the stem above ground the roots will either perish or an immense crop of suckers will result. If an abundant growth arises from the grafts, these shoots from the stock may be removed at the following winter pruning. The wounds should be dressed each year with paint or wax until they are healed over completely. The scions may be reduced gradually to about three or four as they begin to crowd together in growth. When these swell and touch each other near their bases, an incision made at each point of touch will result in a fusion of the tissues into a single stem. Grafts set on old stocks should be supported when they begin to grow. This is best done by tying a bamboo or stick vertically to the side of the stock, so that it projects about a foot above the top of the scion. There is no need to untie the binding strings; they decay soon enough.

WHEN TO APPLY BORDEAUX MIXTURE.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

The value of Bordeaux mixture for *preventing the attacks of curl leaf* (*Exoascus*) upon the peach and nectarine, "shotholes" upon the leaves and fruits of the apricot, the "shothole" in the leaves of cherry, almond, and plum, and the "scab" or "black spot" (*Fusicladiums*) upon the leaves and fruits of the apple and pear, is now accepted by the majority of our fruit-growers.

Those of our orchardists who have most persistently practised the use of this remedy during the last nine or ten years appear to be generally agreed upon the time when it can be used with the best results. Although the quantities of the ingredients used in their respective formulas may differ, upon the mixing, applying, and condition of the vegetative functions of the trees when the mixture is used, they may be said to be fairly unanimous.

Proved Formulas.

The most generally accepted formula is composed of 6lbs. bluestone and 1lbs. of fresh lime to each 45galls. to 50galls. of water. Another good mixture consists of 5lbs. bluestone, 5lbs. fresh lime, to each 25galls. of water. A third recipe, which the writer has used successfully, contains 1lb. bluestone, 1lb. fresh lime, 1lb. molasses or sugar to each 5galls. of water.

The Materials.

Only pure bluestone (sulphate of copper) should be used. An impure sample is usually adulterated with sulphate of iron (copperas) owing to the cheapness of the latter. This sulphate, though valuable for the prevention of some kinds of fungi, is not considered as an all-round equal to the copper sulphate. The lime should be perfectly fresh and caustic, otherwise damage sometimes will result to the trees. The reason why the molasses is added in the third formula is to cause a greater quantity of lime to go into solution, and thus combine more directly (chemically) with the bluestone solution. An increased adhesiveness results, giving this formula an advantage over the ordinary mixture when used in wet localities.

Mixing the Ingredients.

The bluestone may be dissolved either by being boiled in a copper vessel (no iron vessels or utensils should be brought into contact with it), or by having boiling water poured upon it while it is stirred in a copper, wooden, or earthenware vessel. It may also be dissolved by being tied in a loose piece of hessian or bagging *which is suspended just beneath the surface* (not sunken to the bottom) of a vessel of cold water. This latter process, however, occupies a day or two if a fairly large quantity is under treatment. The lime should be slaked



PLATE 1.—PEACH.

slowly by adding small quantities of water from time to time as the lumps absorb it and fall into powder. When it is reduced to a fine powder, and has lost most of its heat, the full volume of water may be added. The limewater—as milk of lime—may then be strained into the bluestone and stirred together. A piece of bran bagging makes a good and readily obtained strainer. A little care in this direction will save endless bother with choked pump valves later on in the orchard, when delays are so exasperating.



PLATE 2.—APRICOT.

The limewater and bluestone solution should not be mixed together long before using, as the mixture loses its adhesive qualities under such a course. When the molasses are used they should be dissolved in water, and that water used in slaking and diluting the limewater. This mixture is green, while the other formulæ are of a lovely blue shade of color. It is said that the lime, bluestone, and molasses combination will keep in perfect condition for weeks if the air be excluded from the surface.

The Application.

It must be remembered that the mixture is a preventive, and must be applied in time to anticipate the attack of the disease by maintaining a poisonous protective coat so long as the danger of infection lasts.

The mixture is meant to destroy the spores of the fungi whenever it comes in contact with them, or prevent the vegetative action of the mycelial growths of such as may afterwards lodge or attempt to grow upon the protected or poisoned surfaces.



PLATE 3.—APPLE.

It therefore follows that the whole of the surface (under as well as on top) of every part of the tree should be coated with the mixture. It goes without argument that rainy or very windy weather is unsuited to performing this work effectively.

To obtain the best results, the mixture should be sprayed from a tank which has an automatic stirring apparatus attached inside of it. The consistency of the mixture will be

even throughout when discharged from such a machine. The best time to apply this remedy is just when the buds are opening. That is best indicated by saying that the colors of the folded petals of the flowers should be visible.

Spores may lie hidden between the folded bud scales, and escape the liquid if sprayed earlier. The opening of the bud scales not only exposes them to the drenching spray, but also exposes the tender surfaces of the expanding florets and leaflets to the protective coating of the poison ere the undestroyed or floating spores can penetrate them with their germinating mycelial tubes. It should always be borne in mind that the same humid warmth which starts the blossom and the leaf of the host plant also starts the vegetative cycle of the parasitic fungi, which we characterise as a disease, preying upon that host.

Plate 1.—The condition of the flower and wood buds, F W F, upon the peach and nectarine indicates the time for applying Bordeaux mixture to

prevent the "curl leaf." It is quite useless to spray these trees after the disease has taken possession of the tissues of the leaves.

Plate 2.—The three lefthand shoots of an apricot show the condition that the buds should reach before the mixture is calculated to ward off the early attacks of the "shot-hole" fungus, known as *Phyllosticta circumcissa*.

The lefthand figures in Plates 3 and 4 convey a fair idea of the development of the respective bud clusters of apple and pear trees when the Bordeaux mixture puts an effective barrier in the way of the attacks of "black spot," or "scab" (*Fusicladium*) in the early spring.

We have thus far only dealt with the early attacks of these diseases in spring, but it is sometimes necessary to repeat the sprayings should the climatic conditions continue highly favorable to the development of fungoid growths.

Showery humid spring weather reaching into the summer months will favor fungus diseases upon our fruit trees. Whenever it is found necessary to again coat the growing fruits with the mixture, it should be made in the same way, with the exception that the *volume of water should be doubled*. This weakens the mixture and prevents damage arising to fruit or foliage. Plate 5 gives one a fair idea of the comparative growths fruit and foliage will have assumed at this stage.



PLATE 4.—PEAR.

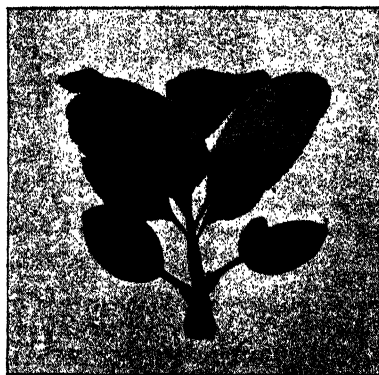


PLATE 5.—CONDITION OF FRUIT AND LEAVES WHEN SECOND SPRAYING IS NECESSARY.

PIE MELON GINGER.—A correspondent writes that he finds the following to be a good recipe:—Pour 1 gall. of water over $\frac{1}{2}$ lb. of lime; let it stand till it becomes clear, and strain through muslin. Cut 12 lbs. of melon into pieces 2 in. square. Pour the limewater over this and let it stand over night. Drain and put the pieces of melon into a pan with 2 qts. of fresh water, 12 lbs. sugar, 1 lb. of well-bruised whole ginger tied in a muslin bag, $\frac{1}{2}$ oz. citric acid, and boil for six hours, adding a cupful of water every hour.

NOTES ON VEGETABLE-GROWING FOR AUGUST.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

Crops of vegetables which appeared to be dormant for some time are beginning to show signs of returning vigor. The thinning out of plants of carrot, parsnip, beets, spinach, turnip, radish, &c., demands attention to make room for this extension. The performance of this work necessitates a certain amount of treading upon the soil between the drills. The footprints should be obliterated by hoe or fork. On ground which does not "cake" badly the Dutch hoe answers well for stirring the surface, but in stiffer soils a fork or pronged hoe makes the best work. Before these hoeings are applied a sprinkling of some quickly-soluble manure should be spread along the drills—a little nitrate of soda, or sulphate of ammonia—the merest peppering will act as a stimulant. Superphosphate is also very valuable if used in this manner, but the coarser form of bonedust cannot be recommended, as the benefit to the plants is not immediate. Weeds must receive attention whenever the sun is strong enough to wilt them when cut.

Unless the planter is prepared to use abundance of water, the season is somewhat advanced for further plantings of cabbage and cauliflower upon the plains. The same remark applies to potatoes. The latter, however, as a rule will pay the small grower for the water better than the former crops.

Successional sowings of salad plants, such as cress, lettuce, radish, &c., should be made in well-prepared beds.

The planting of asparagus and rhubarb should be done without delay. These require plenty of manure—good old decomposed barnyard manure is preferable, though a heavy dressing of bonedust worked into the lower layer of soil gives it a lasting power for feeding these deep-rooting crops. For either of these vegetables the soil should be trenched from 18in. to 24in. deep, and the bottom soil kept in its natural position. For asparagus the rows should be from 18in. to 24in. apart, and the plants set about 15in. from each other in the rows. The best method after the ground is trenched is to open out trenches about 12in. deep and with a mound about 6in. high running along the centre. The plants—two-year old ones are preferable—should then be set with the roots spread down the sides of the mound and the crown resting on the top. The trench is then filled and the crowns covered with from 2in. to 4in. of loose soil. Old asparagus beds should receive a top-dressing of rotted stable manure, which should be gently forked into the soil. A sprinkling of 8ozs. kainit or 4ozs. common salt to the square yard will prove beneficial to these saline-loving plants.

Rhubarb plants are usually set in rows 4ft. apart, with about 3ft. intervening between each plant. Old beds of these will be benefited by a top-dressing of decomposed stable manure. Amateurs can readily increase their stocks by taking up and dividing the roots, provided always that each sett has a crown of buds upon it.

In frames made upon compacted heaps of fresh stable manure sowings of tomatoes and cucumbers will still be made. For the information of the beginner it should be said that from 4in. to 6in. of good rich soil must be spread over the manure if the seeds are to be sown broadcast. If pots are used, a couple of inches of sand will do to stand them on. Growing crops of tomatoes should be "pricked off" into similar frames, giving each of the plants about 4in. growing room every way. Abundance of light should be admitted, or the seedlings will be drawn and sickly. Young seedlings should be kept only moist, if saturated a kind of "damping-off" disease attacks them at ground level, and much loss is occasioned thereby.

The morning is the best time to apply water, so that before the cold of night comes round a good deal of it will have evaporated.

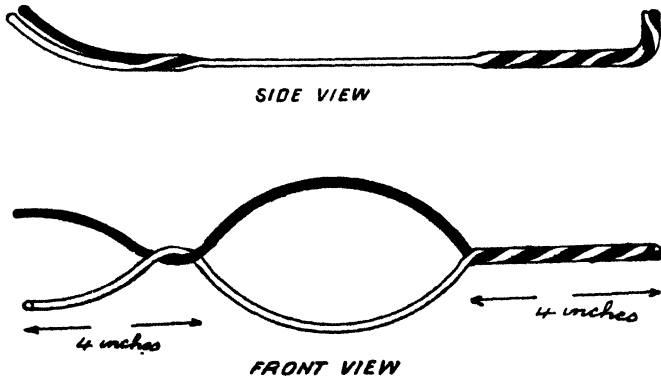
Should the weather warm up toward the end of the month early tomato plants may be set out with safety, if properly sheltered. Many of our commercial growers of tomatoes make coverings by cutting kerosene tins in two lengthways by means of a diagonal section. The top is retained upon one piece and the bottom upon the other. These ends are used as "roofs," while the sides are placed so as to ward off the prevailing cold winds. The lower end of the tin is pushed into the ground to retain it in an erect position.

All unused ground in the vegetable garden should be turned up roughly to the sun and air. If stable manure is to hand, and more particularly if it be fresh, it should be dug in, and given a chance to decompose before the general crops of summer vegetables are sown.

Roots of perennial herbs may be lifted, divided, and replanted with advantage at this season.

YOKE FOR FENCE-BREACHING SHEEP.

Mr. T. Illman, a member of Dowlingville Branch of the Agricultural Bureau, has adopted a simple device to prevent sheep getting through the fences.

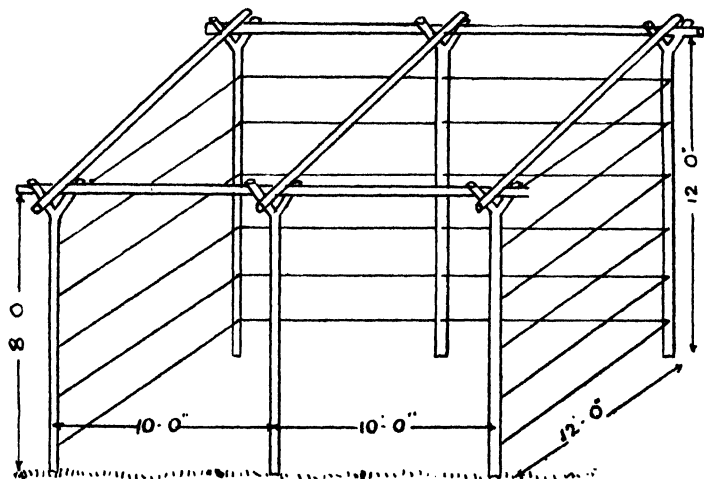


It consists of two pieces of steel fencing wire, twisted at each end and fixed around the neck. There are usually only a few sheep amongst a flock addicted to fence-breaching, and the above yoke has proved effective with Mr. Illman.

SHELTER-SHEDS FOR STOCK AND FARM MACHINERY.

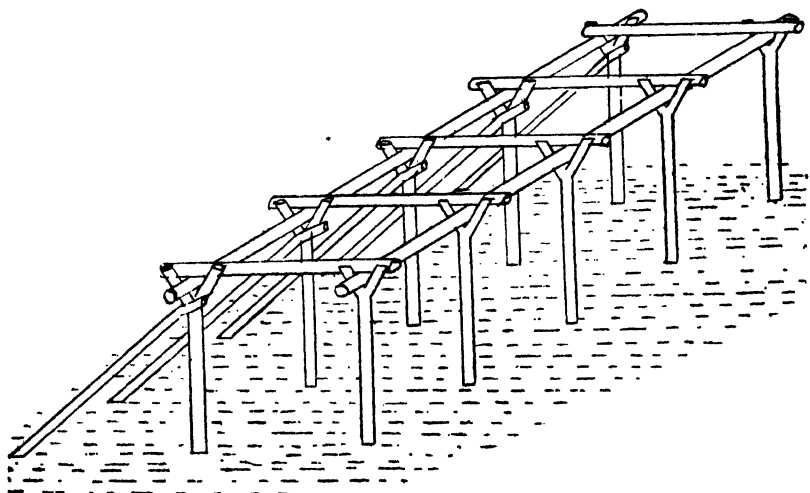
Very cheap and fairly durable shelter-sheds can be built in many places in this State with rough posts, a little fence wire, and the broombush, teatree, or similar woody shrubs and undergrowths from the scrub lands. Forked posts, standing 10ft. to 14ft. out of the ground and sunk 1ft. deep will serve for walls and to support the roof. The posts at the back should be higher than those in front, to give a good pitch or slope to the roof. They should stand 9ft. or 10ft. apart, and the wall-plates (or saplings) should rest upon the forks. The rafters should be placed on top of the wall-plates to the ridge-pole, and the purlines for support of the thatch may be thin saplings or whipstick wattles, or fence wire. The distance apart of the purlines (or battens) must be regulated by the length and rigidity of the material used. Between the upright wall-posts there should be wires, either run through bore holes or fixed by staples, and between these wires the broombush or other material can be placed, and packed closely together. An excellent example of this kind of structure can

be seen at the old Poonindie Mission Station, near Port Lincoln, where numerous open sheds were built years ago by the natives, under the direction of Mr. Bruce, for sheltering wagons, harvesting machinery, implements, and numerous other articles used on the farm. There were also stables and other closed erections, upon similar lines. The material used for "wattling" or filling up between the wires for walls was a scrubby kind of teatree. Examples of the use of broombush with posts and wires for making close rabbit-proof enclosures to gardens may be seen in the neighborhood of Goolwa. These walls, &c., will last good for many years.

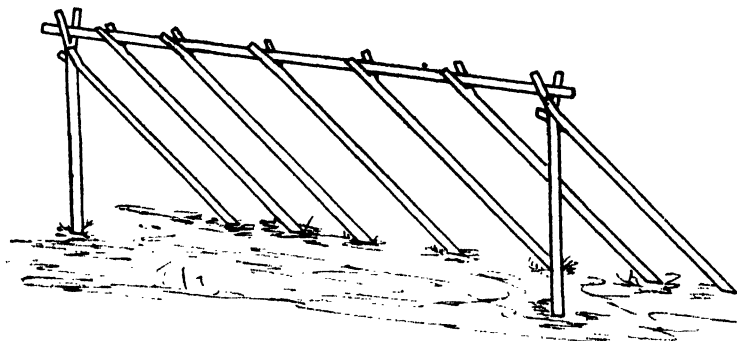


FRAMEWORK FOR WATTLING WITH BROOMBUSH, ETC.

A plan sometimes adopted is to make stacks of straw upon a framework, similar to the following, which was published on pages 432 and 433 of Volume I. of the *Journal of Agriculture* in 1897:—



Or even a few forked props and saplings, like this, would do on a pinch :-



The above can be extended to any length, and the straw, either sheaved or loose, can be piled upon them. The open front should face the south-east, so that the livestock can get shelter against prevailing winds in winter and sunheat in summer. The animals will pull out and eat most of the straw, and as they eat it away the rest will tumble down into the vacant space. From time to time it may be necessary to remove the manure from the shed. If there is enough of straw, some of the bays can be fenced off, and the shelter used for the implements and carts.

IMPROVEMENT OF HORSES.

Considerable attention has been given to the alleged deterioration of horse stock throughout Australia, and many suggestions have been made for remedying this. It is frequently stated that Government or municipal control of stallions, with a view to preventing the use of unsound horses, would be of great help. Owners of valuable horses often complain that, because someone with a flash animal will accept mares at a reduction of 5s. to 10s. less than they can afford, the best animals are not patronised by breeders. It is not unusual for farmers to state that they have unwittingly used half-bred or unsound stallions with unfortunate results. The difficulty that presents itself to would-be introducers of good horses is the uncertainty of securing sufficient patronage at a fair charge to make a profit. It should be possible, by means of the Agricultural Bureaus and Agricultural Societies; to remedy this on similar lines to those adopted in other parts of the world. The members could decide what class or classes of entires are mostly required in their respective districts. ascertain how many mares they can secure at a fee to be fixed, and then communicate with horseowners. A committee could be appointed to examine horses offered, and secure in the agreement with the owners power to limit the number of mares to be served. The adoption of some such system would soon cause our enterprising stockmen to breed or import good useful horses of the classes in demand, and would also remove many difficulties at present in the way of farmers securing the services of such horses. In all probability it would not cost any more, or at any rate only a few shillings more, than the present unsatisfactory system. Portion of the funds raised by Agricultural Societies, and subsidised by the Government, might be used in work of this sort with far more benefit to the district and the State generally than if spent in prizes for exhibits of no practical value to the producing community.

STOCK NOTES.

BY C. J. VALENTINE, CHIEF INSPECTOR OF STOCK.

Reports for the quarter ending June 30 from the District Stock Inspectors show a slight decrease in the losses from disease, but the deaths from local ailments, partly caused by the dry seasons, have been heavy, and occurred over large areas of country. Many no doubt might have been saved had change of pasture been obtainable, and more attention directed to the general absence of nutritious food for the animals, especially where dairying is carried on. The promise of a good season in the early part of the quarter has not been fulfilled, and a short lambing will be general throughout the country.

Mr. R. J. Needham, D.C.I. Stock in the Lower North, reports losses amongst the ewes and lambs from the continued dry weather. Foxes are becoming troublesome, and wild dogs giving a lot of trouble. So far tick and lice have not been noticed to be prevalent. No outbreaks of pleuro-pneumonia have occurred in cattle, but twenty-seven cases of tuberculosis on farms and at markets have been seen. Nineteen were destroyed, five slightly diseased will be destroyed, and three are under supervision. Four cases of cancer occurred, and have been dealt with. Forty reports of disease have been received, and 237 stock were affected; twenty-one animals have been affected with impaction and paralysis, seventeen died, and four recovered after treatment. In the neighborhood where the greatest losses occur many cattle were found suffering from ricketts, showing a want of phosphatic salts in the soil. Horses generally were healthy, with only a few losses reported. Some farmers whose lands are within reach of the fumes from the smelting works at Port Pirie have unfortunately lost horses from plumbism (lead poisoning), nine having died and others were sick. Owners were advised to remove their animals from the reach of the fumes. A number of leaded animals were sold, and the unfortunate purchasers lost heavily. The circumstances are very serious for all those who own land in the vicinity, as treatment is difficult and expensive if thoroughly carried out. Since Mr. Desmond, V.S., Government Bacteriologist, has held *post-mortem* examinations, and is making careful bacteriological examinations, which will no doubt lead to valuable results. Several prosecutions for breaches of the Brands Acts were made, and fines inflicted. The master of a vessel at Port Germein was fined for allowing a foreign dog to land.

Mr. Inspector Williams, in the South-East, reports that lice have shown mostly amongst long wools, and about 4,000 have had to be again dipped. Fluke appeared in one lot of 800, out of which 750 died. Some sheep died with symptoms of staggers, caused by drinking filthy water. Two cases of pleuro-pneumonia in cattle occurred, and were killed; one, a young steer, was the only South-Eastern-bred animal that contracted the disease in quarantine. Thirty cases of tuberculosis came under notice. Twenty-seven badly affected were destroyed, others isolated. Out of 3,424 dairy cows inspected, eight were found diseased, and in the milk of one only were the tubercle bacilli found. This is a marked improvement in the dairy herds in the district, and is encouraging to the inspectors. Five cattle affected with cancer were destroyed; and of two cases of actinomycosis, one was destroyed, and the other, a bull, is under observation. Two animals died from hydatids; one dropped dead through the heart rupturing at the site of a large cyst.

Mr. Inspector Doudy reports in the Southern District the sheep in fairly good condition, not altogether free from tick; but most of those owners who had received notice to dip have carried out the regulations, and there is every prospect that the coming season will see most of the sheep dipped. Pleuro-

pneumonia in rather a malignant form reappeared on Hindmarsh Island. Some good virus was obtained and the herd inoculated, but sixteen died from the disease. Most of the herd has since been slaughtered, being in good condition. Twenty-seven cases of tuberculosis in cattle were dealt with; eight were destroyed, and the remainder, showing small glandular lesions, were withdrawn from milking, and set aside for fattening. Two cows affected with cancer were destroyed, and one was operated upon and is now under observation. Seven cases of actinomycosis came under notice, in six of which the lesions were not serious, and owners were to fatten the animals, and one was destroyed. Most of the horses examined were fairly healthy, though I fear the various intestinal worms are more than ordinarily prevalent in the Hills. I found the larvæ of the botfly in a *post mortem* held at Western Flat, and I understand the botfly was very troublesome in the neighborhood of Echunga and Macclesfield last spring. The season has been most unusually late, and consequently but little green feed grown, causing a large mortality in sheep and cattle, which are tempted to consume unwholesome food, causing deaths from poison, impaction, &c.

Mr. Inspector Winkler, at Quorn, reports sheep as being healthy, but large numbers have died from starvation, especially lambing ewes. Dogs still cause much loss. A number of flocks have been removed northwards, and some hundreds of cattle have also been trucked to the North to better pasture. No outbreaks of pleuro-pneumonia have occurred. Seventeen cases of tuberculosis have come under notice; nine were destroyed, two died, and six isolated for further inspection. Four cases of actinomycosis have been dealt with; two destroyed, two isolated for treatment, if owners will take the trouble. An outbreak of influenza occurred in horses on a farm at the Blinman; they were quarantined and the disease confined to the place. Five horses died, but proper care and food were wanting. A few horses have died from pneumonia, colic, and sand.

Mr. Inspector Curnow, on the Queensland border, reports about 3in. of rain during the six months ending June 30th. Feed is patchy, and not much of it. The Diamantina failed to overflow this year; the Herbert River flooded out moderately. As the crossing has been opened for Queensland cattle it has been taken advantage of, and 1,000 head of cattle from Avon Downs, N.T., passed in the latter part of June. The opening of this route by the flooding of the Herbert River and the rains in its course will enable a moderate supply of fat cattle to reach the Adelaide market. It is difficult to predict what the coming summer season will be. Relief has been experienced, but the drought has not yet absolutely broken up. The tick disease has not made its appearance in this neighborhood.

Eighty *post-mortem* examinations were made by the inspectors; 289,000 sheep were inspected, 25,000 cattle, 5,200 horses, and 400 camels; and the inspectors travelled on duty 15,400 miles.

RELATIVE VALUE OF PIG FOODS.

In a circular issued from the Ottawa Experimental Farm, Canada, the results from a recent series of tests upon the relative values of food in pork production are thus stated:—"When swine are fed with meal, barley, rye, and wheat alone, 4·27lbs. were required to give 1lb. gain, but when swine were fed upon similar meal, half the quantity being given and all the milk they could consume, only 1·20lbs. of meal were required for 1lb. gain and 25·39lbs. of skim milk. One pound meal would thus be worth 8·43lbs. skim milk. A mixture of peas, wheat, and rye, gave 1lb. pork for each 3·43lbs. fed. For comparison, a similar number of swine (experiment 5) were given three-quarters the quantity of the same meal, and all the skim milk they would drink. It was then found that

2·17 meal and 11·10 skim milk gave 1lb. increase in weight. According to these data skim milk may be said to bear the relation of 8·82lbs to one of meal. In experiments 7 and 8 the use of skim milk with maize is exemplified. It is observed that in the one case the maize was whole, while it was ground in the other. The longer period for which the whole maize was soaked in the one case, however, exerted as great an influence as the grinding in the other upon the proportion of nutriment available. The data obtained from these experiments indicate that 1·83lbs. of skim milk were equivalent to 1lb. maize. This serves to emphasise the great value of skim milk as a supplementary food, and as a supplement to no other grain does its effect seem so marked as when used with maize. In experiments 10 and 11, with barley and milk, the same conditions obtain as in the preceding paragraph. It was observed that while of barley fed alone 4·35lbs. were required to produce 1lb. of pork, only 3·64lbs. were required for the same effect when fed with 2·52lbs. of milk. In experiments 12 and 13 the use of milk with a mixture of peas, barley and rye, fed whole, was illustrated. The mixture bore the relation of 1 in 6·99 of milk. In experiments 14 and 15, a meal composed of equal parts of ground peas, barley, and rye was fed in the one case without milk, when 4·36lbs. were required to produce 1lb. of pork, and in the other case, with all the skim milk the pigs would consume in addition to the grain ration, when 3·46lbs. of meal and 4·11lbs. skim milk produced 1lb. of pork. Skim milk, according to this experiment, was worth one-fifth (100·534) as much as an equal weight of the meal. From further tests made with forty-eight swine, it is shown that when a small quantity (about 3lbs. per head per day) of skim milk was fed, a less quantity of it was equal to 1lb. of the grain in the feed consumed per pound of increase in live weight, than when a large quantity (about 15lbs. per head per day) was fed. Skim milk forms the largest part of the feed of young and growing pigs with advantage and economy. For the fattening of swine weighing on the average over 100lbs. each, live weight, it is economical to give an allowance of skim milk not exceeding 5lbs. per head per day. In every case the swine fed with part of their rations of skim milk were lustier, more vigorous, and of a more healthy appearance than swine fed wholly on a ration of grain. Skim milk gives the best returns for the amount fed when it constitutes a comparatively small part of the total food fed. Skim milk may, generally speaking, be considered to be worth from one-sixth to one-fifth as much as mixed grain. When peas, barley, and rye were fed whole ·09lb. more of the mixture was required to produce 1lb. of pork than when fed ground. This is a gain of 2 per cent.

Some experiments conducted by Professor Henry, in America, demonstrate the immense value of minerals in the feeding of pigs. The taste of pigs for ashes is pronounced, and he found that it was based on hygienic principles. Three lots of pigs were fed respectively on maizemeal, maizemeal and bonemeal, and maizemeal and wood ashes. The first lot failed to approach the others in development; they possessed neither bone nor size and were slow in growth, though they laid on fat freely. There was also considerable difference in the strength of the bones of the different pigs, but the gain in weight was more important and striking. For every pound of gain in weight it took 4·87lbs. meal when used in conjunction with bones, 4·9lbs. when used with wood ashes, and 6·29lbs. maizemeal when fed alone. Looked at in another way the experiment showed that the addition of wood ashes or crushed bones to the feed increased the returns from a given amount of food quite 25 per cent.

GREASY HEELS.—Give cooling medicines. Wash the heels with soft soap and rub dry, and apply carbolic oil daily. Rest the animal. Give 1oz. nitrate of potash in bran mash occasionally, and keep the animal clean.

TUBERCULOSIS.

The following article in the *Australasian* on tuberculosis by Mr. S. S. Cameron, M.R.C.V.S., who is working under the Board of Health, Melbourne, is mentioned by Mr. C. J. Valentine, our Chief Inspector of Stock and Brands, as the plainest and most concise and complete article on the subject published, pointing out in a practical manner the effect of the disease and the proper course for cattle-owners to adopt. If followed, he is sure the results would be most satisfactory to all concerned. In a few words Mr. Cameron strikes at the root of the evil, and points out the course to be taken to get rid of the disease.

Tuberculosis of cattle and pigs is identical with tuberculosis of man, *i.e.*, with consumption, phthisis, scrofula, tabes mesenterica, and other tubercular diseases. The disease in man and in lower animals is preventable. For reducing the prevalence of tuberculosis in man it is essential that dairy produce derived from tubercular cows—one of the sources of human tuberculosis—shall not be used as food for man. For the purpose of protecting man against the disease, as also, it may be mentioned, for the avoidance of the great financial loss that occurs wherever the disease gains a footing among cattle or pigs (and here it may be mentioned that in a great many instances cattle that are supposed to have died of poverty are really victims to tuberculosis), it is strongly urged that steps be taken to reduce or to extirpate the disease among dairy cows, many of which are affected with it. To this end the following matters should have careful consideration.

Tuberculosis affects any or all of the organs of the body, and when it is general (not localised) in the system, and especially if the udder is involved, the milk becomes highly infective, so that if used for food it may convey the disease to man, calves, pigs, and other animals. The disease is transmitted from one animal to another by means of the discharges of the animals that are affected, and the infection may take place in the milking-shed, in the paddock, and at camping grounds, waterholes, saleyards, and other places where animals are congregated. In many cases it is very difficult to detect, there being no characteristic sign present; and then the only means by which the disease can be diagnosed is the use of what is called the tuberculin test, which may be regarded as an almost infallible guide as to the existence of the disease. All dairymen and stockowners should have this test applied to their cattle, not merely for their own protection, but also in the interests of the health of their customers. It should be applied only by a qualified veterinary surgeon thoroughly experienced in the use of it or by a pathologist having such experience. In the hands of inexperienced persons mistakes are likely to be frequently made. It should be understood that when it is skilfully applied healthy animals are in no way deleteriously affected, nor is the milk supply of the cows affected either in quantity or quality.

All cattle affected with a cough, with wheezy or snoring breathing, with chronic diarrhoea, with wasting and unthriftiness, with depraved appetite, or with lumps about the neck and jaw, and especially all that react to the tuberculin test, should be at once isolated and kept apart from the rest of the herd, as also from pigs and fowls. Examination of the udders of all the cows should be frequently made, particular care being exercised in the case of cows with uneven quarters. If the quarters of the udder (one or more of them) are found nodulated or lumpy, or to have a hard, cold, and painless swelling, the animal should be at once removed from the herd; for one or more of these conditions will be found to develop as the udder becomes invaded with tubercle.

Animals that show any of the symptoms described above should not be used for milking or for breeding purposes; they should, on the contrary, be prepared for the butcher. As regards breeding, it is essential that the bull of the herd should be free from tuberculosis, and in other respects sound, for while but very few animals are known to have been born with the disease, the predisposition to it or the tendency to contract it after birth, it is generally thought, is marked in the progeny of parents that are tubercular or of weak constitution. As regards the milk, it is specially to be borne in mind that there is no means of ascertaining precisely when the udder becomes invaded, and that the use of milk as food, and, therefore, the sale of it for that purpose from a tubercular cow cannot in any circumstances be approved.

In addition to the measures stated above as needing attention, with the view of reducing the prevalence of tuberculosis, the following further points may be mentioned:—No person affected with consumption or other form of tubercular disease should be employed in the milking, feeding, or tending of milch cows. Scrupulous cleanliness should be observed in carrying out all the operations connected with milking. All manure, stale food, &c., should be removed from the byre immediately after milking. A good current of air, and as much light as practicable, should be admitted into the shed. In dry dusty weather the cow-yard and bails should be sprinkled with water before commencing milking, to prevent the entrance of dust into the milk. The bails, walls, &c., of the byre should be maintained at all times in a thoroughly

clean and sweet condition, and should be disinfected and lime-washed at least every three months. Dry sweeping which raises dust must be avoided. The water supply in the grazing paddock should, if possible, be a running stream. Failing this, drinking troughs supplied with water from a wholesome source, and admitting of being easily cleaned out, should be provided. Waterholes should be avoided; but if there is no other supply they should be fenced off in such a manner as to prevent fouling of the water by the droppings, or a windmill may be provided to pump the water into drinking troughs. The waterholes should be thoroughly cleaned, scooped out, and disinfected with quicklime at least once a year. The favorite camping grounds of the cattle should be ploughed or burned off at least once a year. The burning can be done in the dry season of the year if there is a good growth of grass; or straw, brackens, or other inflammable material may be spread on the surface and set fire to. After the burning, quicklime should be sprinkled over the burnt surface.

FLAVORS IN DAIRY PRODUCE.

BY G. S. THOMSON, N.D.D., GOVERNMENT DAIRY INSTRUCTOR.

Very little has been published up to the present time on the abovenamed subject, and there is no reason to disbelieve that a good field is open to the experimentalist in this important branch of study. Unfortunately for the success that follows scientific investigation, the study of taints in dairy produce has been practically confined to the side of bacteriology, which has undoubtedly attracted the attention of investigators to the neglect of the chemical and botanical sciences. Not alone does plant life play an important part in the flavor of dairy produce, but the health of stock has an influence on the quality of both butter and cheese. How seldom is the chemist, the botanist, or the veterinary surgeon consulted when a serious taint in butter is under investigation; but invariably the bacteriologist is the scientist who regards the trouble as worthy of his careful attention. And this is not the worst neglect, for the practical part of dairying is too frequently backward in lending assistance to discover a cause and a remedy. Practice and science should go hand in hand, and want of knowledge of the former is a serious hindrance to the success of the latter. We hear in lectures and we read in books that the good flavor of our dairy produce comes from the growth of germ life, but we are seldom told that the food of cows has a marked influence in producing the desired aroma. On farms with flat and undulating country, the former rich in rank and succulent pasture, while the latter is grassed with sweet and nourishing herbage, a difference will be found. The undulating land will be productive of an attractively-flavored butter, while the watery and immatured feed of the flats will favor the manufacture of an insipid article. Personally I have had experience of this in the mountainous districts of Scotland, where it is common to hear the buttermakers prize the hilly slopes of the farm from which the choicest butter is produced, and I can remember when the produce of stubbled cows commanded the highest prices in the home markets. To prove that plant life is responsible for flavors in dairy produce we have only to remember the influence that weeds possess in imparting their particular and disagreeable taint to butter. Few farmers are unfamiliar with the flavors of wild mustard and turnips in milk, and the pungent taste that is transmitted to butter manufactured in districts where "cress" and other unwelcome plants are unfortunately plentiful. That our export trade suffered last year from the evil effects of plant-life was well demonstrated, and to show the extent of the injury permit me to quote the following percentages of produce damaged with cowy and weedy flavors (see *Journal of Agriculture*, May, 1901):—

Cowy and Weedy Flavor.

August	28.0 per cent.	October	7.8 per cent.
September	18.0 per cent.	November	2.6 per cent.

Further illustrations are found in practice, and it is well known to the dairy farmer that cultivated crops, as lucern, rape, and cabbages, want attention when fed to milking stock, and likewise is the farmer's care and discretion required when silage is given alone or in a ration with other foods. As certain crops endanger the flavor of milk by imparting taints peculiar to the kind of plant, likewise do foods interfere with the constituents which go to the formation of the milk. We are told also that cows fed on large quantities of brewer's grains yield a milk poor in keeping quality and low in fat, and some authorities regard its use as unsafe to the health of infants. Again, those who have had experience in the feeding of milking stock in Great Britain will bear evidence of the evil results which turnips have on the flavor of dairy produce; and further, oily foods which are frequently used in the old country must be fed with caution to avoid damage of a similar kind.

Stagnant and impure water for milking cows carries with it soluble constituents that lower the keeping quality of milk, and it is an established fact amongst practical men that the produce from cows fed on sewage pasture has defects in flavor and quickly deteriorates by age. We are also aware that the first milk (colostrum) and the last (before calving) are quite unsuited for dietetic purposes; and, when used for cheese or butter making, decomposition soon takes place in the cheese, and in the butter the flavor is quite objectionable. Experience has taught us to reject the milk from cows when they show a desire for mating, and to further prove how the milk is acted upon in the body of the cow, purgative medicines when given find their way into the udder of the animal, and are conveyed to the suckling calf without entirely losing their active properties; but in the mare and sow this is more characteristic.

Not alone is the flavor of butter influenced by food, but color and texture respond to the changes in feeding. Fluctuations in the shades of color occur very markedly in countries where many varieties of green food is given. In fields in Great Britain one can find the pastures aglow with the buttercups and bright yellow-colored wild flowers, and cows grazed on these fields yield milk with a higher shade. As certain foods raise the color of butter, others reduce it, and those foods are well known to dairy farmers of experience. In South Australia we are familiar with the solidity of the product manufactured in the State, and the high melting point of our butter is a valuable feature; this we attribute to the well-matured and nutritious herbage which our stock are favored with, particularly in the early months of summer. We can also claim to possess in our butter a flavor which cannot be surpassed elsewhere, and again we find one practical answer in the sweet herbage of the State. The experienced butter and cheese maker can bring forward many additional points to show how food plays a rôle in the flavor and texture of his produce.

Depot Butter Tests.

The butter tests which were to be conducted throughout the summer had to be abandoned owing to want of the necessary refrigeration at the Government cool chambers. It is expected, however, that the work will be undertaken as soon as the export butter trade reopens; meanwhile I will give the results of the chilling of a number of boxes which were received for testing at different temperatures. The consignment of butter comprised ten 10lb. boxes, and on receipt of same at the dépôt the only alternative was to submit them to the one prevailing temperature, 33° F. The boxes arrived in two lots of five boxes each, and after a practical examination was made and samples taken for bacteriological analyses the boxes were removed to the chamber; but before proceeding with the results of the examination I will give particulars of manufacture of the butter.

Lot 1.—Manufactured March 15th.

1. Made from milk received at factory Tuesday morning, March 12th.
2. Temperature of milk at separation, 84° F.
3. Temperature of cream before churning, 56° F.
4. Acidity of cream before churning, 0.57.
5. Period of churning, thirty minutes.
6. First washing of butter grains in rain water.
7. Second washing in brine made with rain water.
8. Butter grains, size of wheat.
9. Salted at the rate of 3½ per cent. Brand, Black Horse.
10. Preservitas added, 12ozs. to 100lbs. butter.

Lot 2.—Manufactured March 20th.

1. Made from cream received at factory Monday, March 18th.
2. Temperature of cream before churning, 59° F.
3. Acidity of cream before churning, 0.85.
5. First washing in rain water.
6. Second washing in brine, made with rain water.
7. Salted at the rate of 4 per cent. Brand, Black Horse.
8. Preservitas added, 14ozs. to 100lbs. butter.

The reason of the additional dry salt and preservitas was because lot 2 was made from cream collected in the district.

*Practical Examinations.**First Test of Lot 1, March 20th.*

	Flavor.	Texture.	Color.	Total.
Maximum	70	20	10	100
Points awarded ..	68	19.5	10	97.5

Second Test, May 14th.

Awarded	67	19.5	10	96.5
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First Test of Lot 2, March 30th.

Awarded	67	20	10	97
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Second Test, May 14th.

Awarded	66.5	20	10	96.5
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Considerable importance is attached to this test, as the butter was kept throughout the sixty and fifty-five days of refrigeration at a temperature not lower than was previously stated, 33° F. From the practical examinations readers will observe that flavor has but slightly decreased in both lots and that texture and color are unchanged. Had the ten boxes of butter been divided into five lots of two each and chilled at different degrees of cold, as was first intended, we would have had a most interesting and valuable experiment. However, the above results go to prove that well-made butter from sound cream can be stored for at least sixty days at a temperature of 33° F. with very little injury to flavor, and without apparent effect on texture and color. The bacteriological tests of the ten boxes confirmed experiments which were conducted some months ago, proving that water and other organisms can be cultivated in culture media from butter that has been chilled for months.

The test boxes were purchased from the Wilmington factory, and lot 2 was sold in the local market seven days after refrigeration at a reduction of only 1d. per pound on the cost price.

Experiments in Cheese-making.

Experiments in cheese-making have been in progress since the month of February. Four hundred pounds of sample cheese have been taken from the experimental lots, one-half of which are now on their way to Scotland to be finally examined by Professor Drummond, the well-known authority on the practice of

Cheddar cheese making. The experiments were conducted with and without the use of starters, and both the Cheddar and acid systems were adopted in the manufacture. A feature of the test is the extensive account which has been kept of the details in the making of the cheese. All practical and scientific tests known to the industry have been adopted. The humidity of the ripening-room was recorded from day to day by the hygrometer, and the losses in weight of the cheese were taken each week of ripening. Twenty-four butterfat analyses have been made up to date, and from the practical and scientific determinations the Cheddar system occupies the premier position, and it will interest a few to know that the milk was ripened with a starter. Nothing definite will be said until the final scientific and practical results are received from Scotland, when a full report will be published in the *Journal*. The test will determine the keeping qualities of the two systems, and before the last examination is made none of the cheese will be less than seven months old. Control cheeses will be shipped under refrigeration, which will considerably increase interest in the experiments. The tests were carried out under Mr. J. Davidson's care at the Murrumbidgee Cheese Factory.

"DRY" OR "WET" MILKING.

By G. S. THOMSON, N.D.D., GOVERNMENT DAIRY INSTRUCTOR.

In this State, and in all dairying countries, diversity of opinion exists as to whether cows should be milked with wet or dry hands. Dry milking is a strong point with some teachers of dairying, but it is open to strong objections. It does not seem to be clear, however, what is meant by the term dry milking. Assuming it implies that the hands must be kept dry, then it cannot be recognised as a safe operation—involving danger and injury to cows of a nervous and irritable disposition. It is known that milkers object to animals of the smaller breeds of stock owing to the shortness of the teats, and when difficulty arises in milking with the hands moistened, increased irritation to the cow must result from the "modern" dry practice. It might be asked how many men and women can milk with dry hands with comfort to the cow and profit to the farm. I am afraid the number is small, and the training of children (who in country districts do the bulk of this work) would entail considerable trouble. An attendant danger, and one of vital importance in dairying, is efficient stripping of the cow, and I question if the average dry milker has the activity left in his hands to finish this latter duty in a thorough manner. The nearest approach to the suckling calf is the most natural course to pursue, and one that is most appreciated by the cow, but when animals resent their milker, the result of slow, rough, and imperfect milking, at a time when the greatest care and handling is necessary, will be attended with disastrous consequences; and, still further, the old practice will be strengthened if we accept the theory that milk formation is going on in the udder of the cow at the time of milking. That so much should be said against wet milking has arisen because of the universal neglect by milkers to adopt precautions to prevent contamination of the milk supply with dirt and microbe life. The filthy habit of dipping the fingers in the milk pail and having the hands dripping with milk should no longer be allowed. Keeping the hands moist during milking seems the most sensible and safe course to follow, and, with other points attended to, the milk should be free from foreign matter. But does not dry milking cause the fall of particles of dirt and scales from the teats and udder into the milk equally as much as wet milking if there is any neglect in having the vessel and flanks of the cow perfectly clean? (See plate cultures.)

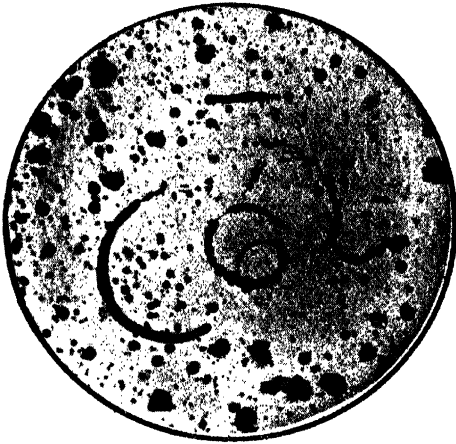


Plate 1.—Cultures from dirty udder, showing growths around hairs; large colonies are from scales and dust. Exposure of plate, 40 secs.

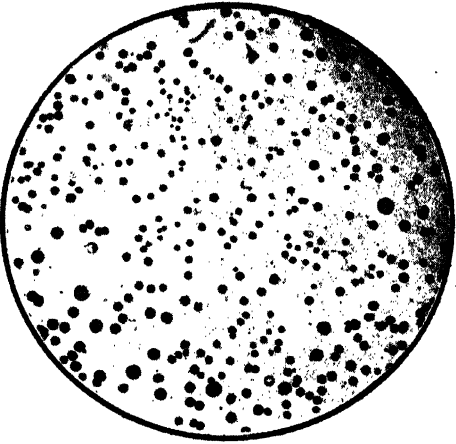


Plate 2.—Colonies from the same udder after exposure of a second plate for 60 secs.

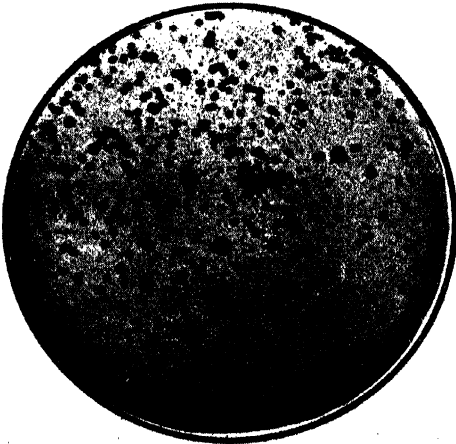


Plate 3.—Freshly-drawn milk contaminated during milking. Colonies of germs from one drop of milk.

If milking were practised according to rules which are stringently pursued on some farms, there would be no reason why foreign matter should find its way into the milk at a stage when conditions are so favorable for the development of bacteria. At dairies in this State where the following rules are adhered to I have made repeated examinations of the choice butter manufactured, and can testify to its very high standard of excellence and freedom from injurious organisms and unwelcome flavors :—

1. Have the cows milked in a clean and sanitary place.
2. The milker must be clean in person.
3. Brush the udder and flanks of the cow.
4. Wash the teats and dry them.
5. Damp the udder and flanks of the cow with a cloth.
6. Moisten the hands at intervals with clean water.

There is no need for washing the udder of the cow unless mud is adherent to the hairs and skin, but it is essential for each milker to be provided with sufficient water that will allow of the teats of every cow being washed in a separate supply, and not, as we usually find, a little in a basin used for a whole herd. It is from such simple neglect as this that so much harm arises in dairying. Every milker ought not only to study the importance of successful milking, but should keep continuously in mind that want of cleanliness is responsible for many of the worries of the butter or cheese maker and milk consumer, and losses to our factories and to the industry. It is into the milking-pail that many of the seeds of contamination are thoughtlessly and carelessly admitted.

Bacteriological Plates.

Readers might take particular notice of these illustrations. In a past number of the *Journal* I have explained how the colonies are grown, but for the benefit of those who have not followed the subject a repetition will be given.

In looking at the plates, which are made of glass, you have the original size before you. The depth is about $\frac{1}{16}$ in., and on the top of each a glass cover is made to fit. In preparing the cultivations the first step was to sterilise the plates with heat, so that organisms would not be left to interfere with the test. After this was done a quantity of culture media, or in other words germ food, was liquefied, and a little poured into each plate. This was allowed to thicken, forming an almost transparent fluid. The plates are now ready for the organisms. Proceeding to a dairy where cows were being milked I selected a cow, and after dusting the udder to remove the large particles of dirt and adhering pieces of straw, I got ready one of the plates and exposed it immediately under the udder for a period of forty seconds. After ten seconds were allowed to elapse Plate 2 was treated in a similar manner for sixty seconds. At this stage the benefits of damping the udder will appeal to readers, and after a glance at the plates everyone will agree to the desirability of the practice. Plate 3 was prepared by inoculating a tube of liquid culture media with one drop of milk taken from the supply of a cow in the yard.

It must be understood that at this part in the experiment nothing but a clear and unmarked surface could be photographed from the plate, which was soon replaced, however, by the many colonies seen in the illustrations. The growth of these myriads of microbes was hastened in an incubator, a steady temperature of 90° being maintained for a couple of days. The plate cultures will be convincing evidence of the responsibilities of the milker and of those who have charge of milk or cream, either in the dairy or elsewhere.

CURE FOR MANGE OR ITCH.—Mix 6ozs. common sulphur, 1pt. of train oil, and 3ozs. spirits of turpentine, and apply with flannel or painter's brush, or use 1pt. of strong carbolic oil in a gallon of water.

FARM HINTS FOR AUGUST.

BY THE EDITOR.

The sooner fallowing is finished the better. If left until the ground gets dry the furrows will turn up in clods, which will remain, and the land will be hollow and dry, even after next season's rains set in. It is very necessary that the sub-soil should be well broken up, and that cannot be done whilst it is dry.

A few acres of the fallows should be well manured and harrowed down for the growth of sorghum or holcus, which ought to be sown by drill during the earliest part of October, or directly danger of night frosts is over. Heavy cold clay land is not well suited for these plants. The horschoc, or similar implement, should be worked between the rows as long as the growth will permit.

Mangolds and beets should be sown for main crops during this month. If soil is rather saline it will be all the better. Sugar beets, Silesian beets, and Globe mangolds should be sown on the shallow lands, and the long mangolds will do on those that are deeper. Five pounds of seed will be plenty and to spare for an acre, and they must be sown in drills, because it is necessary to use the horschoc frequently during the growth of the plant. Drills should be 2½ ft. apart for beets and small mangolds, and 3 ft. apart for the larger sorts. The plants in rows would have to be thinned to 18 in. and 2 ft. respectively, in the rows. After a time the plants will have to be singled, as there are usually two seeds in each capsule. Farmyard manure, or super. and kainit mixed, are good for these crops.

Each farmer should try the effect of harrowing a few strips of his cereal crops, and carefully record the results. It is not sufficient to guess what the result is, but weigh and measure, and then report.

Broad beans should be sown now in drills—4 ft. apart for the tall sorts, and 30 in. for the dwarf kinds. The plants should be 6 in. to 8 in. apart, and may be in double rows, 4 in. apart in the drills. They do well in rather heavy soils, as well as in deep alluvium, and are benefited by lime. Farmyard manure that has been kept sweet by use of gypsum is an excellent fertiliser. The crop benefits and cleanses the land; the beans are excellent food for horses and pigs, and the leaves, &c., are liked by all farm stock.

Two bushels of sunflower seeds will sow an acre in drills 2½ ft. by 1½ ft. This crop must also be regularly cultivated with the hoe. Any potash manure will be useful. Crops of 60 bush. and upwards of seed have been taken in Victoria, but 30 bush. to 35 bush. is good. The seed sells at about 20s. per hundredweight.

In the South-East, and cooler parts of the State, it is usual to sow the main crop of peas during this and next month. The garden varieties ought to pay for growing. They can be cut early, put up in windrows till dry enough, then stacked and chaffed, and the peas winnowed out. The chaff is valuable for cows, horses, and sheep. Two and a half bushels of seed will do for an acre in drills at 24 in. apart. This crop improves the soil in respect to nitrogen, and cleans the land by smothering weeds.

Where late and heavy night frosts are not common, some potatoes may be planted. If ploughed in, every fourth furrow can be used, with 1 ft. between the setts. The setts should be 4 in. deep, and the soil must be fairly well pulverised. It is necessary to use the hoe. Beauty of Hebron, supposed to be synonymous with White Elephant, seems to do best on the plains. Potatoes about 40 lbs., cut in halves lengthwise, are best. For garden cultivation the rows should be 24 in. apart, with 8 in. between the setts. Between 10 cwt. and 14 cwt. of potatoes are required to plant an acre. The best soils are mellow loams, well drained, and rather inclined to sand. The soil can be greatly improved by the

application of 6cwts. of a fertiliser containing 7 per cent. available phosphoric acid, 11 per cent. of potash, and 3 per cent. of nitrogen. This would be found in 3cwts. of superphosphate, 1½cwts. muriate of potash, and 1½cwts. nitrate of soda. Keep down weeds from the first by use of the hoe.

Field carrots and parsnips should be grown for the horses and cows. Sow on deep light soils, in drills 18in. apart, and thin out to 6in. or 8in. in the rows. Roll directly after sowing, and cultivate frequently afterwards, to destroy weeds and to keep the soil open.

Build frameworks with strong posts, wall-plates, and rafters, to serve as sheds for livestock. When the wheat and barley crops are ripe they should be reaped and bound, so that the straw can be stacked on to the framework. If the sheds are open to the south-eastwards they will serve as shelters against sun, wind, heat, and cold, and the animals will pull the straw and eat the greater part of it. Sketches showing how the frameworks may be built are to be found in another part of this issue.

In the South-East, and hilly country to south of Adelaide, it is not too late to sow barley and oats.

In the North, where frosts do not occur, as on the west of Flinders Range, a beginning can be made in sowing maize, sorghum, holcus, and other summer crops for fodder.

It is not advisable to make ensilage pits wider than 10ft., but they may be as deep and as long as the circumstances may require. It is a common plan to divide the pits, both across and lengthwise, by walls, and in advanced cases the roof is built on a tram line, so that it can be run off the pits. The walls should be built 3ft. to 4ft. above the surface, so that the pit can be filled to the top of the wall, and allow for shrinkage. The weights may be conveniently made with kerosene cans filled with concrete, with fence wire loops set in for lifting, and a "whip" is most convenient for lifting the weights and the baskets of silage. A well-constructed silo should last half a century, and will repay its cost within one or two years by economising fodder and maintaining the health and good condition of the livestock.

Lambs should be castrated when one month old. The ewes that have had their lambs taken away should be kept rather short of food, in order to stop the flow of milk. Shearing should be delayed until the weather begins to become a little warmer.

Pen up pigs for fattening, and do not give them any green stuff. Feed on meal, or peas, beans, or hard food, and give as much milk as they will take. Sows on season should not be killed till at least ten days after.

The cheap entire will generally beget worthless weeds; but price of service is not always a criterion of merit in a horse, neither are the show-yard certificates always to be relied upon. There ought to be a certificate given each horse on hire, after most careful examination by a thoroughly qualified man, that the horse is sound, suitable, and fit for the purpose for which he is required.

Rape belongs to the cabbage family, and usually requires a rich, deep, fat soil; but sometimes excellent crops have been grown on deep, sandy loams, supposed to have been "worked out" by wheat crops. The land must, however, be deeply tilled, and if a lot of farmyard manure can be applied, all the better. If sown now there will possibly be a nice lot of feed for the sheep, and the land will be all the better for a following wheat crop.

Prepare some land, where conditions are suitable, for sowing next month with lucern. Deep, light, loamy soils, where the water is within 14ft. of the surface, will generally produce a good permanent stand of lucern. The soil must be deeply and thoroughly broken up, and the surface ought to be as fine and level as for an onion bed. Next month is the time for sowing lucern seed, and it

should be sown in drills 1ft. apart, and $\frac{1}{2}$ in. deep. After drilling, the land should be rolled, to insure good germination, and when the plants are up the harrows should be put to work.

When about to purchase a new implement, do not conclude the bargain until several patterns or makes have been inspected and inquiries made. It is not always safe to accept the statements made by the agents or vendors. They, of course, believe that their own particular implement is the best; but the other agents hold exactly the same opinions concerning the implements they have to sell. Under all circumstances "the best is the cheapest," and it is important to find out which is really the best.

PASPALUM DILATATUM.

The grass which is now being "boomed" in nearly all the States of Australasia under the name of "Golden Crown Grass" (botanically named *Paspalum dilatatum*) is no stranger to South Australia, since the late Dr. Schomburgk introduced it more than fifteen years ago, and spoke very highly of it for cultivation in suitable localities. The Agricultural Bureau distributed seeds of it shortly afterwards through its Branches in all parts of South Australia, and Messrs. E. & W. Hackett presented a few pounds of seeds to Professor W. Lowrie for trial at the Roseworthy Agricultural College. Most of the seeds in all cases failed to germinate, and all of the plants in the dry districts succumbed to the heat and drought. Unless the seeds are specially selected with great care, it will be found that the great majority are sterile, and will fail to germinate. In order to secure a good sward of this grass, it would be safer to plant roots by hand rather than trust to seeds. Planting by hand is, of course, a very costly procedure, and it may be worthy of consideration whether it will not prove more economical and equally satisfactory to thoroughly prepare the land and sow seeds of lucern or other suitable herbs or grasses. *Paspalum* grows well in the South-East, in the hilly districts, where there is moderate temperature, and a fair average rainfall; but it is more than doubtful that it will ever live in the hot dry country characteristic of our northern plains. Because it thrives so splendidly in some parts of New South Wales and Victoria in rich soil, moderate temperatures, and good rainfall, it is deservedly well appreciated; but that is no reason for the assertion that it should thrive on our arid plains and drought-subject North. Rooted plants can be procured from New South Wales and Victorian nurserymen for 12s. per 1,000.

POULTRY NOTES.

BY D. F. LAURIE.

Considerable activity in poultry matters has been lately in evidence, and a great many inquiries connected with poultry reach me daily. Many farmers and fruitgrowers are at last giving serious attention to this much-neglected but valuable industry. I am at all times glad to receive inquiries as to treatment, feeding, &c., or to advise in the matter of purchase of stock. These inquiries are gratifying, as showing that my personal efforts and the past actions of the Government are now bearing fruit. I should like to add to previous remarks, that when writers are making inquiries as to birds they should state definitely the purpose for which they are required. Prices vary largely according to quality, and as to whether the birds are for exhibition or not. Thus high-class

stock birds and birds for exhibition run into pounds, while progeny of the same parents which, while good as layers and of value for cross-breeding or for producing layers, are blemished as show birds, will sell for a reasonable price. One may get such birds, if the progeny of good stock, and do well with them; but with the progeny of really inferior birds nothing can be done. There is a vast difference between the two. Several breeders tell me that they have sent birds at a really low price, and yet gave no satisfaction, as the buyers afterwards complained of imperfections which would only count in a show specimen. Of course no breeder can sell show birds for the price of ordinary fowls, as they only breed very few such in comparison with the number of imperfect birds.

Those who are intending to obtain fresh stock should do so at once, as the breeding season is in full swing, and no time should be lost in hatching stock of all sorts. Those who intend hatching largely should invest in an incubator; there is no loss of time waiting for hens, nor is there the risk of desertion of eggs and breakages. All hens should be set in nests made on the ground; the use of boxes is not to be recommended, especially during hot weather. While the nights are so cold the number of eggs given to a bird should be in accordance with her size and ability to cover them completely. The practice of putting large numbers of eggs under small hens is not a good one. The hen may hatch them, but the youngsters seldom grow into fine birds. Young chickens require frequent feeding—say every two or three hours, a little and often—then, when a month old, four meals a day will do, and from eight weeks old three meals a day will suffice. These depend somewhat on the nature of country the birds run on, and whether there is any natural food for them, such as grubs, insects, seed, grain, &c. All food should be of the best and quite fresh and sweet. Sour sloppy food soon causes disaster. All utensils should be kept scrupulously clean. If after mixing food in a dish it be left for some hours, the remains of the food are hard to remove; but if the dish or vessel is put to soak in water as soon as used, there will be very little trouble in keeping it clean.

Separation of the sexes should always be the plan adopted. The birds grow much better, and, where several breeds are kept, fewer yards are required. As soon as the cockerels grow their tails and begin to crow, they should be drafted into a yard as far away as possible from the other birds. Give your birds plenty of room; overcrowding will surely result in loss and disappointment. The general practice of overcrowding is responsible for most of the disease and lack of success.

Complaints are to hand of vermin attacking young chickens. Want of cleanliness is the cause. Old wooden shanties, which are seldom cleaned out and whitewashed, soon become infested with vermin, and birds roosting in them suffer, young chickens die off, and the older birds cease to be profitable. Other species of vermin infest the birds. These are due to lack of dust baths, where the birds can dust and free themselves from the insects. The heads of chickens are generally badly infested, and the vermin there or elsewhere on the birds are easily destroyed by the application of insect powder, or by rubbing in oil and kerosene—two parts oil to one of kerosene. No kerosene should be put on any sitting hen, as if any gets on the eggs the embryos will perish. The tick must be combated regularly; kerosene or any sheep dip will clear them off and destroy their eggs. When vermin are discovered there must be no half-measures. Every endeavor must be made to exterminate them completely at once.

Entries for the R.A. & H. Society's show close August 23rd. Mr. J. Creswell is the secretary, and the office Waymouth Street. Prizes are offered for various breeds, and in addition the Government are giving £15 for the encouragement

of certain breeds. Mr. Brookman, M.L.C., is offering £10 for poultry for export, and it is to be hoped this will stimulate breeders. The time has come when the question of a table poultry show should be considered. It is evident that those who breed for show only are not interested in utility poultry, and will not forward the interests of commercial poultry breeding. These fanciers preponderate in both the poultry societies, and, as they still remain dormant, steps will have to be taken in some other direction. A show of table poultry was held in Sydney last summer, and was a great success, and the same would result here. Any reader connected with country societies* should use his influence to have utility and table poultry well catered for at such shows. I am greatly in favor of poultry shows and breeding of high-class stock, but I think it short-sighted policy to neglect what is an urgent necessity to the producer in the country, as well as the high-class bird owner. It is to the interest of both to use every endeavor to educate all to the proper knowledge of high-class table poultry, and a better class of egg producers. This subject is receiving great attention in England, and numerous persons of social standing are taking prominent parts in assisting various organisations for the purpose just stated.

NEW ZEALAND FROZEN MEAT INDUSTRY.

A paper read by Mr. D. R. Hutchison before the members of the Courtney Agricultural and Pastoral Association of New Zealand contains some very striking figures dealing with the development of the export in fat lambs and sheep. The trend at present would appear to be towards the extension of the trade in frozen lambs with the natural reduction in the output of fat sheep.

The following table shows the extent of the development that has already taken place :—

Year.	No. of Carcasses of Lambs.	No. of Carcasses of Sheep.
1893.....	325,659	1,428,772
1894.....	487,110	1,512,455
1895.....	558,825	1,667,289
1896.....	730,034	1,425,067
1897.....	781,539	1,682,123
1898.....	1,258,658	1,647,041
1899.....	1,113,340	2,011,175
1900.....	1,294,348	1,862,849
Total for eight years.....	6,547,513	13,236,771

Of the 1900 outturn the Canterbury district sent 927,457 lambs and 687,670 sheep. It will be noticed that while the lamb trade has practically quadrupled in eight years, the export of fat sheep has only increased to extent of 25 per cent. to 30 per cent. Owing to the irregularity in the arrival of vessels carrying meat, the fluctuations in prices are considerable, but the trade on the whole is profitable. Last year the London prices for lambs varied from 4½d. per pound in February, to 6½d. in June, and then fell to 4¾d., rising again in November to 6½d. With sheep the season opened at 3½d., rising to 5½d. in June, and falling to 3½d. in August, rising again to 5½d. The sudden stoppage of River Plate export of live sheep had a considerable influence upon the price of New Zealand mutton.

The trade in sheep and lambs of Argentine, Australasia, and New Zealand compare as under :—

		1898.	1899.	1900.
River Plate	{ Lambs	7,038	3,379	3,292
	{ *Sheep	2,000,000	2,500,000	2,329,000
Australian	{ Lambs	89,334	233,500	315,979
	{ Sheep	1,150,000	1,116,000	970,000
New Zealand	{ Lambs	1,137,060	1,238,925	1,294,348
	{ Sheep	1,647,041	2,011,175	1,862,849

* Approximate.

On April 30, 1900, the flocks of sheep in New Zealand were as under :—

	North Island.	South Island.	Total.
Merino	146,496	2,556,767	2,713,253
Crossbred	9,856,677	6,790,255	16,641,942

The total number of sheep is given at 19,355,195, as compared with 19,348,506 in 1899.

WEATHER AND CROP REPORTS.

BAKARA (July 20).—Weather cold and dry. Crops and feed are backward and stock in fair condition.

BALAKLAVA (July 22).—The weather has been too dry for the time of year, and there have been several sharp frosts, consequently feed has not grown much and in some parts of the district it is very scarce. Crops are all much more backward than at this time last year, but are looking healthy. Fallowing will be practically finished by the end of the month, and farmers are hoping for a good fall of rain to bring up the weed seeds brought to the surface. Stock are healthy but not improving much on account of cold weather and shortness of feed.

BRINKWORTH (July 29).—Stock, sheep, and cattle in very low condition on the whole, feed being very late. Crops, though not high, are stooling out well, and, with the splendid rain of last few days, ought to come on well now. Rainfall to date, 1·94.

CRYSTAL BROOK (July 27).—The weather has been very favorable. Showers, though light, have been frequent, the best rain for the season falling during the night of 26th, when 14in. was registered. The ground has now had a good soaking, and, with more of the right sort of weather, a good season may be expected. The late-sown crops, so far, are the best. Stock are in fair condition, and as the feed is now coming on they should soon begin to move up. Rainfall to date, 2·40in.

EUDUNDA (July 19).—This month has been a great improvement on the earlier part of the season. With fine days following the rains the wheat plants are coming on nicely, and feed everywhere is springing up. The prospects for the season have improved much the last fortnight.

JOHNSBURG (July 23).—Rain badly wanted. The wheat is just showing above the ground, but can make little progress until a good soaking rain falls to penetrate the subsoil. Very little fallowing has been done. Stock are generally in very fair condition; but those kept on the farms have to be fed. Most have been removed to the bush country. The lambing has not been favorable, owing to the absence of green feed for the ewes. Altogether the prospects for coming harvest are very poor.

LUCINDALE.—Nice seasonable rains fell this month. A little water is showing on the flats, but not quite as much as on the average winter. Stock is doing well. Lamb marking is not yet general, the weather being a bit too changeable. Crops are just about at a standstill, but look well.

MALLALA (July 19).—The weather has been seasonable of late, and the crops are beginning to move. Owing to lack of rain early in the season weeds and wild oats did not shoot, and in all probability many of the crops will be dirty. The grass is growing slowly and sheep are improving. Owing to the good hay crop of last year stock and cattle have been kept in fairly good condition. Fallowing is the order of the day.

MOUNT REMARKABLE (July 19).—Since last report the rainfall recorded here amounts to 1·40in. The wheat crops have now got a fair start, but are backward owing to rain coming so late. Grass and herbage are still scarce, the frosts retarding their growth, and stock are generally in low condition.

NANTAWARRA (July 23).—The weather has been cold and dry. The crops, though backward, are looking healthy, but will soon require more moisture. Feed is very scarce, and so stock that are not fed are only in fair condition. Rainfall for month to date, 0·57in., and for year, 7·67in.

ORROROO (July 26).—The weather has been very favorable. Several good rains have fallen. Snow also fell on the 27th. Owing to the cold, crops and grass are making slow progress. Fallowing will be backward on account of the scarcity of feed. Stock are in fair condition.

PASKEVILLE (July 23).—The weather has been dry, only light showers falling. Frosts and cold weather have retarded the growth of the crops, which are backward. Feed is very scarce. Fallowing will soon be completed.

PINE FOREST (July 26).—Steady rain has now set in. On the whole the crops are more backward than last year. Early sown, however, are too forward, and as they are coming into ear it is feared that they will be injured by frosts. Rainfall for month to date, 1·09in., and for year, 6·38in.; as compared with 0·93in. and 7·65in. for same periods last year.

PORT ELLIOT (July 27).—Weather cold and showery.

PRYAT (July 22).—The weather has been cold and frosty, and crops and herbage are growing slowly. Rainfall for month to date, ·75in.

REDHILL (July 25).—The wheat and grass are growing slowly. Light rains have fallen during the month. A good soaking rain is badly wanted. Fallowing is being pushed on with. Lambing has been fair.

RICHMAN'S CREEK (July 22).—The season to date is about the driest on record. For the six months ending June 30th, 2½in. of rain only has been recorded, and since that date ½in. has fallen. Some of the wheat has come through the ground, but it is making very little growth. Feed is scarce and stock have to be hand fed.

SADDLEWORTH (July 24).—Feed still very backward, and but little growth in wheat paddocks; a very trying season so far for lambing ewes and dairy cattle; a good soaking rain much needed. Rainfall is 5in. below average for the year so far. Busy fallowing, the black ground working well. Rainfall this year to date, 6·38in.

STANSHURY (July 27).—The weather has been all that can be desired. The rains, although not so heavy as in other seasons, have been regular, and have given the crops a fair start. Feed is somewhat short, but it is expected to grow better when warmer weather comes.

YORKETOWN (July 20).—Crops are growing nicely, but more rain is required. Stock in fair condition.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Company report :—

August 1, 1901.

Very cold dry weather prevailed during the early part of July, but moister conditions set in later, during the past few days the best fall of the season being reported from many parts; but no good subsoil soaking has yet this winter gladdened the hearts of farmers in what are usually known as our drier districts, and it is earnestly hoped a wet August will be experienced, to give wheatgrowers there the prospects of a good harvest, many of whom for five years at least have had most disappointing returns.

The city was very gay and business brisk during the ducal festivities, but has again settled down to ordinary conditions. Trade in the country is quiet in most directions, owing to the backwardness of the season. The continued low price of lead is having a very depressing effect upon commerce in Broken Hill, owing to the closing down of some of the mines and the uncertainty about others. It is in such times as this that we have to fully realise how closely our producers are interested in the mining industry. In other directions mining matters are moving slowly, but generally towards greater developments. What is said to be a new important find is reported from Tarcoola, but it will take some substantial gold yields on that field to awaken interest, which has become very dormant owing to the slow movements in opening out a number of the properties that were so much talked of a few months ago.

In breadstuffs the month's history showed some movements. During the early part European markets continued to fall, under the influence of favorable harvest prospects, until 27s. per quarter, c i f., for Australian cargoes was best obtainable, when reports of a most unusual heat wave occurring in America, which was said to be shrivelling up the grain in many parts, brought out speculative Australian cargoes afloat and to land, advancing until up to 30s. was paid. This and an easing in freights gave an opportunity of raising buying rates, which has induced more active business in the line. Locally trade in flour is mostly confined to filling bakers' contracts, but fair business during the month has been done with Westralia, and some good parcels forwarded to South Africa and the East. Millers have been able to maintain their rates for bran and pollard, and report good clearing sales. Whilst the dry spell of

weather lasted trade in hay and chaff was fairly brisk, some Victorian buyers beginning to operate here, but the fine rains has checked at least speculative buying, and caused holders to slightly weaken, so that easing tendency in price is showing. Feeding grains have moved steadily without any quotable alteration in value.

Inter-State quotations for potatoes have controlled values here, and must continue to do so for next couple of months. Heavy orders from South Africa and the East, in addition to good demand from the other Australian States, caused price in Tasmania to advance, New Zealand soon following; but quotations were evidently forced too high, some African orders being resold in Australia. This caused a reaction, but the market seems to be steadying again at what producers must admit is still a good figure. Our locally-grown stocks have not been drawn upon much during the month, about 500 tons still remaining in the Mount Gambier district, but these will practically be used up during August. The high price reached making potatoes dearer than flour has caused lessened consumption; and this may also be said of onions, demand for which has dwindled down to less than one-half for time of year. Values in these have hardly altered.

Unusually brisk business in dairy products in anticipation of extra heavy demand during the ducal celebrations marked the first week of the month. Some lines, notably butter, were forced up to extreme rates, but the inevitable reaction set in even before the festival week had expired, values in this particular dropping back about 6d a pound within a week. A rise in Victoria setting in whilst we still were dependent upon importations for a part of our requirements, however, placed a check on the downward trend here, creating quite a dearth for a few days, and prices went up again about 2d., local supply being barely equal to wants; but a few fine days may be expected to cause a marked increase in supply, and August, as usual see us producing at least a small surplus; in fact, already there are signs of an imminent run down in value. A recovery in price of eggs occurred, as we expected, but the seasonable drop has now set in, a fall of 5d. a dozen showing within about a week, and spring rates will doubtless soon be reached. Good trade has been doing in bacon and cheese; values remain unchanged. A larger demand for honey has been experienced, but low quotations throughout Australia prevents any material advance in price. Beeswax scarce. Almonds very short of requirements.

Excellent demand has continued for carcass meat and poultry at good prices, even turkeys at last advancing. Catalogues during the month were heavy, but buyers competed keenly for all submitted.

MARKET QUOTATIONS OF THE DAY.

Wheat.—Port Adelaide, 2s. 8½d. to 2s. 9d.; outports, 2s. 7½d. to 2s. 8½d. per bushel of 60lbs.
 Flour.—City brands, £3 2s. 6d. to £6 5s.; country, £5 17s. 6d. to £6 per ton of 2,000lbs.
 Bran and Pollard.—11½d. per bushel of 20lbs.
 Oats.—Local Algerian and dun, 2s. to 2s. 2d.; prime stout feeding, white, 2s. 9d. up to 3s. 3d. per bushel of 40lbs.
 Barley. Maltng. 3s. 8d.; Cape, nominal at 2s. 3d. per bushel of 50lbs.
 Chaff.—£3 3s. to £3 8s. per ton of 2,240lbs., bags in, dumped, f.o.b., Port Adelaide.
 Potatoes.—Gambiers, £7 to £7 5s.; Tasmanians and New Zealand, £7 10s. to £8 per 2,240lbs.
 Onions.—Locals, £11 10s. to £12 per 2,240lbs.
 Butter.—Creamery and factory prints, 1s. 5d. to 1s. 7d.; private separator and best dairy, 1s. 4d. to 1s. 5d.; good store and collectors', 1s. 3½d. to 1s. 4½d.; New Zealand bulk, 1s. 2d. to 1s. 3d. per pound.
 Cheese.—South Australian factory, 9½d. to 10d.; New Zealand, 9½d. to 10½d. per pound.
 Bacon.—Factory-cured sides, 6½d. to 7½d.; farm lots, 6½d. to 6¾d. per pound.
 Hams.—South Australian factory, 7d. to 7½d. per pound.
 Eggs.—Loose, 9d.; in casks, f.o.b., 10½d. per dozen.
 Lard.—In bladders, 8d.; tins, 7½d. per pound.
 Honey.—2½d. to 2½d. for best extracted, in 60lb. tins; beeswax, 1s. 1d. per pound.
 Almonds.—Soft shells, 6d. to 6½d.; kernels, 1s. 2d. per pound.
 Gum.—Best clear wattle, 2d. per pound.
 Dressed Poultry.—Fowls, 1s. 8d. to 2s. each; turkeys, 7d. to 8d. per pound.
 Live Poultry.—Ordinary to prime table roosters, 1s. 9d. to 2s. 4d. each; fair to good hens and young cockerels, 1s. 4d. to 1s. 7d.; ducks, 1s. 10d. to 2s. 4d.; geese, 3s. 6d. to 4s. 6d.; pigeons, 6d.; turkeys, from 5½d. to 7d. per pound, live weight, for good quality table birds.
 Carcass Meat.—Handy shop porkers, 5d. to 6d.; good baconers and fair porkers, from 4½d. to 4¾d.; rough and heavy carcasses, lower; vealers fetch from 2d. to 3¾d. per pound for fair to good.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, flour, and forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of July, 1901:—

Adelaide	2.06	Hoyleton	2.49	Macclesfield	3.40
Hawker	0.79	Balaklava	2.46	Meadows	3.35
Craddock	1.01	Port Wakefield	1.63	Strathalbyn	2.45
Wilson	0.72	Saddleshworth	2.20	Callington	2.26
Gordon	0.90	Marrabel	2.23	Langhorne's Bridge	2.26
Port Germein	1.74	Riverton	2.11	Milang	2.50
Port Pirie	2.18	Tarlee	2.25	Wallaroo	2.06
Crystal Brook	1.66	Stockport	2.38	Kadina	2.17
Port Broughton	2.27	Hamley Bridge	2.06	Moonta	2.04
Bute	1.80	Kapunda	2.20	Green's Plains	2.05
Hammond	1.37	Freeling	1.84	Maitland	2.51
Bruce	1.29	Stockwell	2.00	Ardrossan	1.46
Wilmington	3.90	Nuriootpa	2.03	Port Victoria	1.57
Melrose	3.77	Angaston	1.91	Curramulka	2.50
Booleroo Centre	1.91	Tanunda	2.12	Minlaton	2.86
Wirrabara	3.22	Lyndoch	2.14	Stansbury	2.25
Appila	1.86	Mallala	2.69	Warooka	2.47
Laura	2.50	Roseworthy	1.45	Yorketown	2.24
Caltowie	2.36	Gawler	2.24	Edithburgh	1.73
Jamestown	2.13	Smithfield	1.89	Fowler's Bay	1.29
Gladstone	1.53	Two Wells	2.37	Streaky Bay	1.88
Georgetown	3.32	Virginia	2.06	Port Elliot	3.34
Narridy	2.61	Salisbury	1.93	Port Lincoln	2.74
Redhill	2.19	Teatree Gully	2.81	Cowell	2.46
Koolunga	1.59	Magill	2.97	Queenscliffe	1.65
Carrieton	1.58	Mitcham	2.58	Port Elliot	2.20
Eurelia	1.74	Crafrers	4.28	Goolwa	1.88
Black Rock	1.23	Clarendon	3.09	Meninnie	1.91
Orroroo	1.69	Morphett Vale	2.37	Kingston	3.13
Johnburgh	0.99	Noarlunga	1.80	Robe	3.95
Petersburg	1.65	Willunga	2.54	Beachport	3.50
Yongala	1.66	Aldinga	1.82	Bordertown	1.42
Terowie	1.45	Normanville	2.11	Wolseley	0.78
Yarcowie	1.38	Yankalilla	2.35	Frances	1.56
Hallett	2.04	Eudunda	2.08	Naracoorte	2.27
Mount Bryan	2.49	Truro	2.30	Lucindale	2.64
Burra	3.39	Mount Pleasant	4.13	Penola	2.32
Snowtown	1.82	Blumberg	2.71	Millicent	3.41
Brinkworth	1.94	Gumeracha	3.18	Mount Gambier	3.05
Blyth	2.35	Lobethal	3.92	Wellington	2.08
Clare	3.72	Woodside	3.13	Murray Bridge	2.56
Mintaro Central	3.09	Hahndorf	3.07	Mannum	2.31
Watervale	4.25	Nairne	2.83	Morgan	1.00
Auburn	3.34	Mount Barker	3.37	Overland Corner	1.06
Manoora	1.99	Echunga	3.29	Renmark	1.19

CALIFORNIAN LEMONS.—The great value of the Californian lemons has been again demonstrated in a recent test in New York. Twelve fancy California and twelve fancy Mediterranean lemons of same grade and as nearly equal in appearance as possible were selected by a disinterested expert and tested by a leading firm of chemists, whose report shows that the Californian lemons were slightly heavier and had considerably more juice and less seeds than the Sicilian lemons; 90½ Californian lemons would yield 1 gall. of juice, while it would take 128½ Sicilian lemons to produce the same amount; 300 Californian lemons would yield 26.6 ozs. of crystal citric acid, and a like quantity of Sicilian only 19.7 ozs. The import of lemons into the United States and the shipments from California tell the same story in another way; yet a few years since the idea of California competing on equal terms with the product of the Mediterranean coast was strongly ridiculed.

CENTRAL AGRICULTURAL BUREAU.

MONDAY, JULY 15.

Present—Messrs. F. E. H. W. Krichauff (Chairman), H. Kelly, T. B. Robson, and A. Molineux (Secretary).

Congress.

The SECRETARY reported arrangements being made for the forthcoming congress in Adelaide during September. Two railway tickets for each Branch had been applied for, and the Hon. Minister would be asked to open the congress. [Ministerial approval has since been obtained.—GEN. SEC.]

Modiola decumbens.

The CHAIRMAN called attention to report of Mr. E. M. Sage, of Balaklava Branch, that this plant had grown well with him, and that it was seeding freely. The plant was highly valued in arid districts of South America.

Branch at Reeve's Plains.

The formation of a Branch at Reeve's Plains was approved, with the following gentlemen as members:—Messrs. W. H. George, E. Handcock, W. Day, H. Day, J. G. Folland, M. Richter, J. Dawkins, and J. J. McCord.

New Members.

The following gentlemen were approved as members of the undermentioned Branches:—Gumeracha, Mr. J. Kitto; Artherton, Mr. J. Welch; Morphett Vale, Messrs. H. Smith and A. Binney; Boothby, Mr. M. Leonard; Inkerman, Mr. Thos. Briggs; Murray Bridge, Messrs. John Standon and G. Newmann; Strathalbyn, Mr. P. McAnancy; Tanunda, Mr. W. Goecke.

Reports by Branches.

The SECRETARY reported receipt, since previous meeting, of fifty reports of Branch meetings.

REPORTS BY BRANCHES.

Watervale, June 3.

Present—Messrs. E. W. Castine (chair), S. Solly, J. Thomas, H. Scovell, B. Perrin, W. Smith, and E. Treloar (Hon. Sec.).

SEED EXPERIMENTS.—Mr. Smith tabled splendid specimen of kohlrabi, grown from seed received from Central Bureau. He believed it was named Goliath.

CALVES OR PIGS.—A long discussion took place on the question of which was the more profitable—to feed separated milk to pigs, or to use it for rearing calves. The general opinion was that, at present prices, it was more profitable to rear calves.

Richman's Creek, June 4.

Present—Mr. W. Freebairn (chair), J. J. Scarle, A. Knauerhase, J. A. Knox, J. M. Kelly, A. Nicholson, M. Hender, E. Roberts, P. J. O'Donohue, J. McSkimming, W. J. Wright, J. McColl (Hon. Sec.), and one visitor

DAIRYING.—Mr. P. J. O'Donohue read a paper as follows:—

As interesting subjects, like our resources, are getting exhausted, I will give a brief outline of my experience in dairying—an industry that has been anything but successful during the past seven or eight years. When the hundred of Willochra was thrown open for selection, in 1876, after a wet winter, we saw it at its best, with all the creeks running and the plains covered with a splendid growth of herbage. From the drought of 1864-6, or for nine years, the North had enjoyed a succession of good seasons, which we hoped were going to continue, but 1876 gave us an idea of what we had to expect. Had we seen it in that state the previous year I would not have been here. As the next three years, 1877-9 were fairly good, our hopes were again slightly raised. Then came 1880 with a poor return; 1881-2 total failures. Although the crops failed in those years, we generally had heavy summer rains which caused a rapid growth of annual saltbush, buckbush, runner, and a variety of other weeds, which, while troublesome on fallow land, were nevertheless good feed for stock. Finding it impossible to make a living on wheat-growing, and not having the land or means to go in for sheep, I had to turn my attention to dairying. Having succeeded in raising a fairly good herd of dairy cows, I, in 1890, purchased a cream separator and all the necessary appliances to run a butter factory on a small scale, which enabled me to compete successfully with factory lines in the Adelaide market, and after the passing of the Butter Bonus Act I sent a good quantity to the London market, some of which realised as high as 114s. per hundredweight. At that time I was making 200lbs. of butter per week. Not trusting to the natural growth, I made every provision possible for feeding. In 1890 some of my crop was blighted, and useless for wheat, so I cut it for hay, covering it with roofing felt. Not requiring it in 1891, I found the benefit of it in 1892, when there was no rain to start any feed until August, but the heavy rains of that and the following months caused a heavy growth. I cut about 100 tons of hay that year, and nearly as much the next. With stacks securely thatched I thought I had made reasonable provision for any ordinary drought, not dreaming of one of seven or eight years' duration. There was none cut for hay in 1894-5, and my herd of cows had increased to nearly thirty head, so that by May of 1896 the whole of my supply of feed was run out. Then my trouble began in earnest, which anyone buying feed for a lot of stock will quite understand when taking their wasting propensities into consideration. Of course such a state of things could not last long. Funds first, then credit became exhausted; I had to let them die, so that in 1898 all I could muster out of thirty head of one of the best herds in the North was twelve, some of which were culls that had been dried off with the intention of fattening, which accounted for them being alive. From these twelve cows, for several weeks while the feed was at its best, we made over 120lbs. of butter per week. I believe others in the district have reached the same average, which I think will knock the bottom out of some of the theories of our experts who make such a strong point of the importance of pure breeds. In travelling down to attend the Annual Congress held in Adelaide in September, 1899, I took particular notice of the dairy cattle on the way, also at the Adelaide show and at Roseworthy College, yet I have not seen anything like as fine a class of dairy cows as was to be found between Quorn and Hammond before the present drought. With the exception of Bodalla, New South Wales, I doubt if a better class of cows could be found in Australia. Some prefer the Jersey, but I do not think they will suit the North, as they seem too puny for the rough times prevalent here. The bad seasons have been against our success with our pure-bred Ayrshires. The best to be found in this district have descended from Short-horns, Herefords, and Devons—the latter, generally a dark-red, are not always good milkers, but good doers, which is much in their favor. The best that I have seen it would be impossible to trace their origin. I consider the breed is of very little importance. In dairying the principal object is to secure a good milking strain; then by weeding and careful selection you can keep up to a fair standard. Unless the cow is a good grubber she cannot be a good milker, which depends solely on the quantity and quality of the feed consumed. In reference to feeding I have never tried ensilage. I find hay, if cut very green, the most convenient, although the butter does not retain its flavor on it as well as when fed on chaff and bran. I have been feeding my cows since February last, the first two months on hay, and since on bran and cocky chaff, which, without stalls, is anything but a pleasant or enjoyable occupation. One drawback to the northern dairy farmer is the distance from market. In order to get my produce to Adelaide in good condition I bought six butter boxes with trays, costing 21s. each in Adelaide; each box weighed about 30lbs., and held over 50lbs. of butter; with careful handling they should last twenty years, as they were made extra strong, but not strong enough to stand the rough handling on the South Australian railways. A few weeks ago one (or a part of one) came back in ten pieces, the trays gone altogether. There seems to be a growing prejudice in some quarters against the use of hand separators, but situated at long distances from a factory or creamery they are indispensable, as it is impossible to carry on dairying without them. I consider the small separator of under 20galls. per hour capacity a mistake, as apart from the loss of time they soon get out of order, and the exorbitant price for these articles is altogether too high. The first one I got was of 35galls. per hour, costing £38 in Adelaide, and carriage to Bruce £1 7s. Last year some of the parts getting worn, the manufacturers for some reason having stopped making that class, and no fittings being procurable,

I had to get another separator of 65galls. an hour, costing £30—a big item in a bad season. I am sure either of these were made in Sweden for £5, so someone must make a big profit. In conclusion, those who like myself are compelled through necessity to turn their attention to dairying for a livelihood, should pay the strictest care and attention to cleanliness and to all other details connected with the industry.

The Hon. Secretary did not think selected Shorthorn cows could be surpassed for profitable dairying in the North. The surplus stock was always of more value than those of the smaller breeds, and this perhaps deserved more consideration than it would in the Southern districts. In fair seasons the herbage was richer and more nourishing than in the South. Mr. Hender considered the ordinary cows of the surrounding districts a few years ago were equal to Mr. O'Donohue's estimate of them; but since the drought the average was not so good. He had seen boxes of butter very roughly used on the railways. [It is a duty falling upon anyone who finds another man's property being wilfully injured or ill-treated to take steps to have the offender punished. In the cases referred to the Commissioner of Railways should at once have been furnished with fullest particulars, so that he could have an inquiry made, and be placed in a position to rectify the loss to the owner, and to adequately punish the offenders, who, if not stopped, will continue to break and damage the property of the railway customers, and cause incalculable loss in every direction.—GEN. SEC.] As to sending cream to Adelaide, he had churned a can of equal quantity and quality at home, and received 5lbs. more of butter than was returned from one sent down to an Adelaide factory. Mr. Knox said he was perfectly satisfied with the returns from cream he sent down to the city factory. Yield of butter depended largely upon the condition of the cream. If out of condition or over-ripe the returns would be less than when the condition is perfect. He did not think the milking strain of Shorthorn could be excelled.

OFFICERS.—The officers for past year were thanked and re-elected.

SEED WHEAT.—At March meeting it was recommended to keep seed wheat for one year, and not four years, as printed in April *Journal*.

ANNUAL REPORT.—As at last annual meeting, the membership remains at fourteen. Nine meetings have since been holden, with an average attendance of over ten. Four valuable practical papers have been read and many other interesting subjects have also been discussed. A paper was also read by the Hon. Secretary at the Quorn Conference in February. The season has not been very favorable for experimenting with seeds, drought and locusts being the principal causes of failure. Experiments are being conducted with the use of superphosphate on wheat crops to determine what quantity will prove to be most profitable, and plots have been dressed with 80lbs., 100lbs., and 160lbs. per acre respectively. Results will be reported in due course.

Craddock, June 29.

Present—Messrs. R. Ruddock (chair), J. H. Iredell, J. Turner, J. Paterson, P. Gillick, W. H. Haggerty, A. E. Clarke, J. H. Lindo (Hon. Sec.), and two visitors.

"BEST BREED OF CATTLE FOR DISTRICT."—Hon. Secretary read the following:—

It is unwise to establish a herd of puro-bred dairy cattle in this locality, as dairying under any system will not pay here, for there is no profit left after all expenses are deducted in sending cream, butter, or cheese so great a distance to market. Seasons are so precarious here that a cream or butter factory in the district is altogether out of the question, for it is only in extraordinary seasons that a farmer with half a dozen cows could get sufficient milk to warrant using a separator, prolonged droughts being prevalent, during which there is but very little succulent feed; therefore the wise course to adopt

under the circumstances is to breed for general utility. All the best breeds of dairy cattle are small and of more delicate constitution than the beef-producing breeds. Besides, it has been unmistakably observed during the present prolonged drought that the greatest mortality has been amongst the best dairy-bred cattle, which shows that they have not such robust constitutions as the beef-producing breeds, or that they are not such good foragers. My ideal of utility cattle is a cross between the Shorthorns or Durhams and the Herefords—either a direct cross, viz., first cross, or subsequent cross-breeding to either side—always providing that not more than two-thirds majority of breed be towards either side. Probably the Shorthorns are the heaviest, being larger jointed, but in proportions of beef to bone the Herefords are their equals, being smaller and lighter in bone. One sometimes hears of the “Milking Shorthorn.” I believe it is practicable to establish a milking Hereford, for there are good and bad milkers of either breed. And if it is desired to establish a good milking strain, breed from the heifers of a good milk cow, and be sure that the bull also is from a good milker; and keep on breeding from generation to generation, always selecting the progeny of good milkers to breed from. The old saying is ever true, “The bull is half the herd,” and in time a reliable strain of good milkers would be the result. The reason for favoring the above cross is that the Shorthorn has breadth everywhere—shoulder, back, hips, and loin. From the Hereford we get depth and breadth of shoulder, great depth of brisket, also depth in ribs and thighs, with a short light shank bone; and thus by blending these two breeds of cattle we get an ideal for “general utility.” Milk, butter, or cheese can be obtained from them for all household requirements, as the best of them only need be used for dairying. One of our most practical farmers remarked at our last meeting that, owing to this terrible drought having diminished the herds in the pastoral country of New South Wales and Queensland, and the herds of smaller graziers of this State, there is going to be great demand for good framed cattle for many years to come. Therefore cattle-breeding, if carried on with proper system, will be a paying industry in this locality, and the class of cattle I have recommended are the most serviceable to breed, for the best milkers could be used for the dairy, and the others fattened or sent to market; and, whether fat or in store condition, would always command a good price, because of their ample proportions. Added to the foregoing good qualities of such a breed of cattle would be quietness, contentedness, thriftiness, and beauty. In conclusion, avoid breeding small framed cattle, for a well-developed steer of the large breed, if fat, is now worth at 3 or 4 years old about £15, while one of the smaller breed is only worth about £10; and beef will be beef for some years to come. Breed as many cattle of the class recommended as there is run and feed for, and they will pay well for next few years.

After discussion it was resolved “That the most suitable bull to cross with the cows at present in this district is the Hereford.” A visitor said he favored the best beef breed of Shorthorns to use with the mongrel cows of the locality, though they were good milkers. It was mentioned that Mr. Turner had recently procured a pure Hereford bull.

RAINFALL.—Mr. J. Turner tabled the following particulars of rainfall for Cradock:—1898, 8·23in.; 1899, 8·54in.; 1900, 7·76in.; 1901, January, *nil*; February, 1·76in.; March, 0·50in.; April, 0·18in.; May, *nil*. The average of three years was 8·17in. per year. [The average for about twenty years, as per State meteorological report, was about 11in., but the last four or five years have been exceptionally dry. As there have been several complaints that the averages of rainfall for the past twenty-five years, as published in this *Journal*, do not correspond with the averages taken by members of Branches and others for the past five or six years of drought, it has been decided to withdraw the column.—GEN. SEC.]

Dowlingville, June 28.

Present—Messrs. J. Phelps (chair), R. A. Montgomery, F. Roberts, T. Illman, G. F. Mason, J. Birkin, T. Lombladt, and John Louis Broadbent (Hon. Sec.).

PICKLING SEED WHEAT.—Members directed attention to error in report of latest meeting on May 5. Mr. Foggo first washed the seed to cause the bunt balls to break, and then he pickled the seed with bluestone. In the other case the seed was not washed first, but was pickled. The crop from the washed and pickled seed was practically free from bunt, whilst that from the unwashed but pickled seed was badly bunted.

Bakara, May 31.

Present—Messrs. R. Barrow (chair), J. E. Dietrich, H. R. Hayward, J. E. A. Siedel, F. E. H. Martens (Hon. Sec.), and one visitor.

COST OF WHEAT-GROWING.—Mr. Hayward read a paper on the “Cost of Wheat-growing” :—

He thought if most farmers had sat down and thoroughly counted the cost of wheat-growing before they commenced they would never begin the attempt to make a living off the land. There was no doubt that the farmers on the Murray Flats were only half farming their land, but their financial situations did not permit of rectifying a mistake which many of them were fully aware of. “Never carry all your eggs in one basket” is the advice frequently given, but many of the unfortunate landowners are only possessed of the one proverbial basket. To grow wheat, even on a small scale, the cost of stock, implements, &c., represents a good round sum. He considered the following absolutely necessary :—

	£	s.	d.
Four-furrow plough	26	0	0
Nine-tine scarifier	24	0	0
Four-leaf harrows	4	10	0
Seed sower	6	0	0
Drill	45	0	0
Mower	17	0	0
Horsrake	9	0	0
Damp-weather stripper	58	10	0
Wagon (English)	40	0	0
Tip dray	15	0	0
Spring dray	14	0	0
Buggy	35	0	0
Six horses at £10.. ..	60	0	0
Harness	21	0	0
	<u>£375</u>	<u>0</u>	<u>0</u>

This was simply an outline of the things necessary to carry on farm operations, and then under favorable conditions what was the result? The farmer may make a living, but it will be little more with wheat at present prices. In addition to the outlay on stock implements, there was the expense of clearing the scrub, which in his own case costs about 10s. per acre. He put down the cost per acre on land that did not require manure to grow a crop of wheat in this district at 16s. per acre, made up as follows :—

	s.	d.
Ploughing	5	0
Seed, 1s. 6d.; sowing, 3d.	1	9
Reaping, 3s. 6d.; cleaning, 9d.	4	3
Cartage	1	2
Fencing (including wire netting)	2	0
Rent	0	5
Sundry expensis	1	5
	<u>16</u>	<u>0</u>

Woodside, June 24.

Present—Messrs. R. Caldwell, M.P. (chair), G. F. Lauterbach, J. C. Pfeiffer, A. Pfeiffer, C. W. Fowler, W. Rabach, A. Lorimer, J. D. Johnston, R. P. Keddie, W. Drogemuller, R. W. Kleinschmidt, and A. S. Hughes (Hon. Sec.).

HOLSTEIN BULL.—Mr. J. C. Pfeiffer reported that the Holstein bull purchased by the Branch was doing well. The committee of management to inspect and report to next meeting.

CONGRESS.—The Chairman and Mr. Rabach promised to prepare papers for the Thirteenth Annual Congress, to be held in September next.

SHEEP ON FARMS.—Mr. Johnston spoke in favor of the practice of keeping a few sheep even on small farms. The grass certainly was improved thereby, which opinion was indorsed by several members.

FERTILISERS.—The use of commercial fertilisers was discussed. Members reported that these fertilisers were almost universally used, and with satisfactory results in this district.

APPLES FOR GERMANY.—Mr. Drogemuller read an extract from a German newspaper concerning the importation of apples from Australia, in which it was stated that apples had been imported by Germany (Hamburg) from Tasmania and South Australia, and that those from South Australia were even superior to those of the Tyrol, in Switzerland. They are beautiful in appearance, of a nice color, and in most instances of excellent flavor. A good percentage of the cases of fruit were badly packed, but those which arrived in the best order were wrapped separately in tissue paper and packed in wood wool. The fruit next to the bottom and sides were badly bruised and rotten in the badly-packed cases. Well-packed Dunn's seedlings brought as much as 36s. per case of about 42lbs. weight of fruit. Mr. Schroder, the writer in the newspaper mentioned, says the Australian apples arrived in Germany during spring, when fresh apples are highly appreciated, and the demand must increase as the merits of the fruit become more widely known. The fruit is reshipped from London to Hamburg, and in May last 6,500 cases were thus introduced.

Forest Range, June 27.

Present—Messrs. J. Rowley (chair), J. Green, A. Brockoff, G. Monks, W. McLaren, and H. H. Waters (Hon. Sec.).

CO-OPERATION.—Discussion in connection with the South Australian Fruit and Vegetable Company resulted in the Hon. Secretary being instructed to write to the secretary of the company suggesting that the directors should furnish the General Secretary with copies of the prospectus, &c., of the company for distribution amongst the Branches. [But the General Secretary cannot make use of the Bureau to advertise any company, however much he may be in sympathy with its aims.—GEN. SEC.]

CODLIN MOTH BANDAGES.—Mr. Monks advocated woollen cloth for bandages instead of bran bags and similar material, as it was much warmer, and consequently a more effective trap. Mr. J. Green had proved this, and in his opinion it was well worth trying by other growers.

Wandearah, June 24.

Present—Messrs. G. Robertson (chair), W. J. Fuller, A. W. Davidson, W. Roberts, C. E. Birks (Hon. Sec.), and three visitors.

PROFESSOR LOWRIE.—A resolution expressing regret at Professor Lowrie's decision to resign his position was carried unanimously.

ANNUAL REPORT.—The Hon. Secretary's annual report showed that there had been a slight improvement on previous year in the attendance, which averaged just over ten per meeting. Few papers had been read, but a number of practical matters had been well discussed.

STOCK DISEASES.—This subject has received considerable attention of late owing to the heavy losses experienced by residents of this district, and members are determined to spare no pains to arrive at the cause and the remedy for the trouble. The General Secretary had advised giving the cows bonemeal, salt, and sulphate of iron as preventives, but this would have to be given to all cattle, and as a regular thing, as there were no preliminary indications that the animals required treatment. Fat healthy-looking animals are taken off as suddenly as those in poor condition. Death occurs so suddenly that there is no time for any treatment that may be adopted to save the cow.

Lipson, June 1.

Present—Messrs. E. Thorpe (chair), W. F. Darling, R. Haldane, J. McCullam, H. Brougham, G. Carr, J. Wishart, A. B. Wishart, J. F. Potter, E. J. Barrand (Hon. Sec.), and two visitors.

MANURE EXPERIMENTS.—Suggestion from Central Bureau that a member should carry out experiment with different quantities of manure per acre for wheat was discussed. One member promised to try the experiments if he had the super. to spare. Mr. Potter had applied 1cwt. of super. per acre on five acres of well-fallow land, and, if it was a financial success, would try 2cwts. next year. Where heavy dressings are used the land should, he thought, be well fallowed and thoroughly prepared for seeding. Mr. J. Wishart sowed fifty acres of freshly-ploughed land last year, and had quite as good growth as on his fallow land, each being manured alike with super. The crop on the fallowed land, however, stood the dry weather better and produced better grain than the other portion.

STALLION FOR THE DISTRICT.—The Chairman read suggestion *re* introducing a good draught stallion for service in the district. Members thought it would be better for one man to purchase a horse on his own account. [How many farmers can afford to purchase a good draught stallion on the chance of the neighbors availing themselves of the services of the horse to an extent sufficient to return a profit on the investment?—GEN. SEC.]

SAND IN HORSES.—Mr. Darling wished to know what treatment was best to remove sand from horses. Mr. Carr knew a farmer who gave his horses flour in the feed occasionally to prevent sand accumulating. Mr. Brougham thought a good square feed would help to carry off the sand. Mr. Potter advised giving 8ozs. Epsom salts, and then to roll the animal well. [The following have been found most effectual in removing sand from horses:—Give a winebottleful of yeast, then throw the horse on its back, roll it from side to side, and rub the belly in order to shake up the sand. Then inject, per rectum, a few gallons of warm water (comfortable to the hand); let the horse rise, and most of the sand will be voided. Give feed of pollard damped with warm water. (2) Or give a hot bran mash on an empty stomach, followed by good feed of pollard and water, mixed to the consistency of gruel.—GEN. SEC.]

HARVESTING WHEAT CROPS.—The Hon. Secretary read the following paper on "Notes on how to Harvest a Wheat Crop":—

Doubtless the complete harvester is the machine of the future; but a great many farmers are not in a position to spend about £100, and allow their stripping machine to lie idle, or sell it for one-quarter its actual value. It behoves us, therefore, to do the best possible work with the machinery we have. It is the farmer's duty to see that his harvesting machine is in first-class working order before his crop is ripe. To start reaping with a machine out of order may result in the loss of several days of the best reaping weather, and at the most critical time. It is also false economy to attempt to reap a crop with a comb too open, or otherwise in a bad condition. If a comb wants closing, do not on any account take it to an ordinary blacksmith to have it battered out with a hammer; better pay a pound or so more and have a good job made of it. Commence reaping as early as possible, but not before the crop is properly ripe. Care should be taken not to reap while there are any green grains to be seen when emptying the stripper. Green grains will depreciate the best sample of wheat. The damp-weather stripper is superior to the ordinary machine. If the two are in equally good working order there should be a considerable saving in favor of the former. The former thrashes better than the ordinary, and, if the crop has lodged, the ordinary machine will bring in a lot of straw with head attached. These mostly go out with the chaff when winnowing, and are lost. If, by chance, a good-thrashing ordinary machine is secured, it is sure to crack and spill more wheat than the other, because all the thrashing is done in the drum of the machine. In case of a crop lodging, I find the false comb (if properly made) a great advantage, and one can be easily made in a couple of hours by any handy farmer with a smithy. Take a bar of $\frac{3}{4}$ in. or 1in. iron just the length of the machine drum; swedge down an inch at each end to about half the ordinary size; punch five holes in the bar an equal distance apart; rivet firmly in each hole so punched one end of a $\frac{3}{4}$ in. bar 18in. long; after pointing or

sharpening the other end, drill a $\frac{3}{4}$ in. hole in the rim at each end of the drum; make two short eyebolts out of $\frac{3}{4}$ in. iron, and fix first-mentioned bar of iron to the drum with the eyebolts. One other hole should have been punched in the main bar, and a short bar of iron (or steel, as iron is apt to bend) 1 ft. long; fix at a 45-degree angle from fingers of false comb. When the false comb is in position this bar of steel will be nearly upright; a light piece of chain should be attached to the top of this bar and tied back to gear bar rest. With this chain the false comb can be easily adjusted; the points of the false comb fingers should be slightly whipped, and should carry about 6 in. below the machine comb, and stand out about 4 in. beyond it. The false comb not only lifts a lot of leaning wheat, but also prevents a great deal of straw being taken into the machine. It is always best to winnow wheat as it is reaped, but where it is not practicable to do so great care should be taken to select a good ground floor for emptying on. On no account choose a spot where there is much small gravel, as a loss of wheat will be sustained when the heap is cleaned up, besides which there is a risk of getting small stones in the good wheat. If the winnowing machine used has a bag-filler attached the man who sews the wheat bag should keep a sharp lookout to see that the wheat that runs into the bag is of uniform good quality, for unless a careful watch is kept a slight change in the wind, or the overloading of the sieves of the machine, will perhaps cause a bushel or so of badly-cleaned wheat to run into the bag unnoticed. If the sieves of the machine cannot be adjusted to make a really good sample of wheat, or if the grain contains a lot of foreign seed, it is much wiser to put it through the machine a second time than to attempt to pass off an indifferent sample, for if farmers would only take more care in cleaning their wheat the imperial standard weight of South Australian wheat would soon be raised. Cornsacks should be spread out in the sun at least one day before being used. This is especially necessary if the cornsacks are good and strong; it will make such bags hold 10 lbs. or 15 lbs. of wheat more than they would otherwise hold. This brings me to the treatment of the offal. It is not necessary to make so many different qualities of screenings, as most people do; it is generally sufficient to make one class of screenings, and never more than two. If a farmer has a quantity of headings, he should certainly thrash them. This can be quickly and cheaply done by carting all the heads to one place. Connect a reaping machine (damp weather by preference) to a horseworks machine by a fairly long belt, which can be easily done. The reaping machine should be screwed up as high as possible, and the heads can be thrown into it with an ordinary four-pronged fork. If the weather is warm the grain will be thoroughly thrashed out of the heads, and is, I believe, the best and cleanest way of doing the work.

Forster, June 27.

Present—Messrs. J. Retallack (chair), W. Johns, J. Sears, F. Randell, J. Johns, F. Johns, J. Childs, W. Sears, J. H. Prosser, E. Schenschler (Hon. Sec.), and seven visitors.

CONGRESS.—Members suggested that the subject of general diseases in stock should be discussed at Congress. Sand in horses and impaction of cattle were particularly mentioned.

DOES FARMING PAY?—Mr. W. Johns read a paper on this subject. He contended it did when the farm was properly conducted. New land should not be cropped more than twice in succession; it should then lie out in grass for two seasons and be fallowed before cropping again. Fallowing should be done in June or July, and the land afterwards worked well to keep it clean and ready for sowing early the following season. All bush should be cut each season. One drawback to fallowing in this locality was the sand drifts, but in many cases this could be stopped by carting stones from the rough land on to the sandhills. It would involve a lot of labor, but once done the work would be lasting. Up-to-date implements should be used on the farms, as they did the work cheaply. They did not want any implement that required more than five horses to draw it, as five were quite enough for one man to properly look after. It will pay to breed and keep good horses. Five well-fed animals will do more than seven that are half starved. A few good cows and poultry should be kept by every farmer; also a small flock of sheep. A flock of sheep will keep the land cleaner than two five-horse teams working the land. All machines, wagons, drays, &c., should be painted at least every other year. Heavy wheels should be painted annually with boiled linseed oil. The oil

should be put on boiling hot just before harvest in order to let it dry well before wheat-carting commences.

POULTRY.—A discussion on poultry on the farm ensued. Members were agreed that poultry were most profitable on the farm, but require more care and attention than they usually receive. Fowls should be well housed and kept in lots of fifty to sixty. They should be fed regularly three times a day. Mr. Randell thought the possibilities of an export trade in eggs with Great Britain promising. He considered eggs should be bought by weight and not by the dozen. Selling eggs by weight would encourage those who keep pure stock and large egg-producing fowls.

Swan Reach, June 29.

Present—Messrs. P. A. Beck (chair), R. Harris, E. Micke, F. Fisher, W. Hecker, L. Fidge, D. Rowe, F. Brecht, P. Hasse, J. L. Baker (Hon. Sec.), and W. Wilson, of Bakara Branch.

BRANCH SHOW.—It was decided to hold a combined branch show at Swan Reach in October, and to ask Forster and Bakara Branches to co-operate.

BACON-CURING.—The Hon. Secretary initiated a discussion on curing bacon and the way to cut the meat to suit the Adelaide requirements. Mr. Hecker said he had had very considerable experience in this matter. He cured bacon as follows:—Make a brine of 16galls. of water, 18lbs. of salt, $\frac{1}{2}$ lb. each saltpetre, allspice, and carbonate of soda, and 1lb. brown sugar, boiled together; skim, and then put in cask for about fortnight. In cutting up the pig, take off the head, cut the carcass in halves, and take out the rib bones. Cut the hams somewhat heart-shaped, the shoulders square but not large, and the sides square. Pigs weighing 90lbs. to 120lbs. fetch the best price. Mr. Wilson had many years' experience in curing pigs, but always dry salted. He used a little saltpetre with the salt, rubbed it well in, and put the meat into a cask for a few days, then turned and added more salt if required, the blood and brine being removed. The meat is then left for about a fortnight in the cask. Mr. Hecker considered that brine-curing gave a better color than dry-salting, as the latter left the meat white in places. Members generally thought one system as good as the other.

Port Pirie, June 29.

Present—Messrs. P. J. Spain (chair), W. Smith, T. Gambrell, T. Jose, F. Humphris, H. B. Welch, G. Hannam, E. J. Hector, T. A. Wilson (Hon. Sec.), and Mr. Geo. Stone of Port Germein Branch.

CONGRESS.—Members suggested discussion at Congress on following subject:—Best stage at which to gather apples and pears and best method of conserving them.

NORTHERN CONFERENCE.—Members favored holding the Annual Conference at Port Pirie next year.

TREES AND RAINFALL.—Mr. Jose read a paper on this subject. Wheat has been lying in the soil for months without sufficient rain to cause it to germinate. Early settlers told them that there used to be plenty of rain in the district; at times even too much for profitable wheat-growing; the growth was rank, and red rust resulted. Now they got neither rank growth nor good yields. He considered that the marked deficiency in the rainfall was due to the removal of and scarcity of trees. In its natural conditions there was a large area of growing timber, thick bushes, and various grasses. The rainfall was sufficient to serve, and a vast quantity ran to the sea, the watercourses running for months. Now

80 per cent. to 90 per cent. of the original covering of the soil has vanished, and bare, bleak land remains, on which they tried to grow stock and crops. To grow wheat the land must be cleared, but if only half the area had been cleared they would have got better crops and suffered less from drought. In his opinion the stump-jumping plough was responsible for many droughts; probably it would have been better for Australia if it had never been invented. Its use caused the country to be rapidly cleared, and this wasteful process still continues. Nature worked harmoniously. Forests and vegetation are supplied with the moisture as they need it. The moist humid atmosphere of the forest attracts the rain clouds, which yield up some of their moisture. The forests have gone, and nothing remains to attract the clouds. To regain the rainfall they would have to replant large areas—a little each year. The necessity for tree-planting on a large scale was becoming recognised here and elsewhere. Landowners should plant more largely of trees suited to the soil and locality.

WHITE ANTS.—Mr. Hannam asked for solution that would prevent ravages of white ants. [Dissolve 1oz. white arsenic in a pint of hot water with $1\frac{1}{2}$ oz. washing soda, add 3ozs. sugar, and as much pollard as will make a stiff dough. Make hollows in the soil close to the trunk of the attacked trees, place in the hollows pieces of the dough about the size of a walnut. Cover with a piece of slate or board to exclude all light. The termites (or “white ants”) will eat the dough and die, and the other termites will eat their dead companions and die also. In termite-infested land it is advisable to grow the trees from seeds on the spot where they are to remain, and bud or graft on to them the varieties which it is desired to grow.—GEN. SEC.]

RAINFALL—Mr. Hector reported on rainfall for first six months of each of the past four years, as follows:—1898, 6.56in.; 1899, 6.98in.; 1900, 9.04in.; 1901, 5.72in.

Rhine Villa, June 29.

Present—Messrs. J. Vigar (chair), A. G. Payne, H. Mickan, W. Farey, W. Start, G. A. W. Schick (Hon. Sec.), and three visitors.

WHITE ANTS.—Mr. Vigar asked for remedy for white ants attacking fruit trees. [Refer to answer in report of Port Pirie Branch in this issue.—GEN. SEC.]

MANURES.—The use of commercial fertilisers was discussed, and the opinion expressed that properly used they did not cause any blighting of the crops.

SHEEP ON FARMS.—Members are of opinion that all farmers should keep a flock of sheep, the size depending on the area of each individual farm. Mr. Payne thought it would pay to provide shelter for sheep by means of rough sheds or breakwinds during the winter, and also to feed hay to sheep, especially breeding ewes, when the dry feed becomes poor. Mr. Farey considered it more profitable to graze sheep on stony soil than to attempt any cultivation, as the grass could not be killed and the crops made clean.

Gladstone, June 1.

Present—Messrs. W. A. Wornum (chair), C. Gallasch, J. Gallasch, J. Shepherd, J. Rundle, J. Milne, W. Brayley, D. Gordon, J. Smallacombe, E. Coe, J. King, and C. Goode (hon. sec.).

PAPER.—The Hon. Secretary read a paper on “Branches of the Bureau: How can they be Made more Useful?” as follows:—

This is of considerable importance and well worthy the consideration of all our Branches. We have an active and efficient Central Bureau, which receives the latest information and

results of practical tests and scientific research from all parts of the world touching agricultural and kindred pursuits; but the work of the Central Bureau will be to a great extent made of little effect unless the Branches are also active and effective. It seems to me it is the duty of the Branches to demonstrate in the various districts the best methods of production, and distribute the information received from head quarters among the surrounding producers. The Bureau organisation is maintained at the expense of the general taxpayer, and the public generally should be able to avail themselves of all information and experience gained by the Bureau. If the Bureaus only exist to benefit the members, then they should be maintained solely at the expense of those who benefit. But properly worked, and by making public all information, there is no reason why the Bureaus should not only be of benefit to the farming population, but to the whole community. We should be the pioneers of every new method by which production from the agricultural standpoint may be increased, or a saving in the cost of same effected. Now, in reference to the regular meeting of the Branch I think a programme should be arranged, and the members appointed in turn to open up the different subjects chosen by reading a paper or giving an address, while every other member should come prepared if possible to contribute something to the discussion. Thus, by the expression of individual opinion and the exchange of ideas, much valuable information might result, and by the gist of the discussion being published in the *Journal of Agriculture* there would be an exchange of ideas and opinions with other Branches. At each meeting suggestions, useful hints, questions, &c., could be called for, and thus small, but perhaps very useful, items of interest might be brought to light. No doubt among the members of the various Branches there is some inventive faculty, and any little labor-saving contrivance, no matter how apparently insignificant, could be described. Each member might keep a note of anything that occurs to him, or that he may have observed, and report it to the next meeting. Then I think we might undertake a good deal more in the way of experimental work. It may mean a little extra care, expense, and time, but the experience we would gain will more than repay the extra trouble. The results of such experiments would provide interesting matter for discussion at our meetings. New wheats, different quantities and kinds of manure, and different crops, treatment of land, &c., are all matters in which there is plenty of scope for experimental work. By these and other means which may suggest themselves to members I think a great improvement could be made on the manner in which we conduct our meetings and work our Branch Bureaus. To sum the matter up, it is for each member to take an active interest in the work of the Branch, and to endeavor to contribute something towards making each meeting a success. If this is done I am sure much good would result.

After a good discussion it was resolved that at each meeting one subject at least shall be selected for discussion at the next meeting, and some members selected to open the discussion.

EXHIBIT.—Mr. C. Gallasch showed cane of a White Crystal grape vine, one year's growth, and 18ft. 6in. long.

Amyton, June 27.

Present—Messrs. Joseph Gum (chair.), Thomas Gum, R. Brown, John Kelly, S. Thomas, and H. Turner (Hon. Sec.)

ANNUAL REPORT.—Hon. Secretary reported eight meetings held during the year, with average attendance of nine members.

OFFICERS—Officers were thanked and re-elected, Mr. S. Thomas being elected Vice-chairman.

DAIRYING—Mr. Thomas Gum read a paper to the following effect:—

He was satisfied dairying will pay, even in the dry Upper North country, if the business is conducted as it should be; but doubted if it would be possible to grow the summer fodders. Dairy farmers should practice ensilage wherewith their stock could be supplied during the autumn and early winter months. A considerable quantity of wild oats and other rubbish that is useless for hay would make good fodder for cows if ensiled. Milking cows should have a change of food, with bran and copra cake. Cows must be liberally fed in order that they may yield a full supply of milk, rich in butter fat. It costs as much to keep an inferior cow as it does to feed a first-class and profitable animal. The milking should always be done twice a day, at regular hours, equally divided between the twenty-four of each day, especially when they are in full milk, and should be rapidly done, but not roughly, and the stripping should be complete. Water should be readily available, and not far away, for if the cows have to travel

far for water they will drink but seldom, and then in excess. If water is close to their feeding place they will drink as required and lie around the watering place if the weather is warm. During the last two months he had kept record of expenses and income for five cows. The cost of bran, pollard, and copra cake was £2 8s., and carriage of cream 2s. The return for produce sold was £6 16s. 1d., the profit being £4 6s. 1d. There was next to no feed in the paddocks at the time. For twelve months' work the cost for six cows on bran, pollard, and copra was £3 9s. 6d. and carriage on cream £1 5s.; total, £4 14s. 6d. The return for produce was £37 2s. 7d., giving a profit of £32 8s. 1d. This profit might have been larger had not the season been a bad one. If it had been possible to send the milk to the factory instead of separating the cream at home the return would have been better.

FOWL CHOLERA.—Several valuable Leghorn fowls have died under the following circumstances:—They mope, fail to eat or drink, are scoured, with thin yellow or green droppings, become weak, and in two days are hardly able to stand. Droppings then become green, and they die within three to five days. [This is evidently cholera, caused probably by dirty water. Remove the birds to new ground, give them a tonic in their water, see that the water is pure, change it often, keep it in clean vessels, and, above everything, keep the drinking vessels in a cool shady place.—GEN. SEC.]

QUESTIONS.—What is the quantity of molasses usually mixed with chaff for horses or cows? [Three pounds of molasses in 1 gall. of water, sprinkled over 100lbs. of chaff; sometimes a little salt is added.—GEN. SEC.] What is the usual ration of linseed meal or copra cake for horses or cows? [About 1lb. weight per day in two rations is about as much as can well be spared when the high prices ruling here are considered; but in Europe they would give 2lbs. per day. The ration should be stopped occasionally, else the animals will put on too much fat.—GEN. SEC.]

Nantawarra, June 29.

Present—Messrs. Jas. Nicholls (chair), J. W. Dall, H. J. Spencer, E. J. Herbert, S. Sleep, E. J. Pridham, A. H. Herbert, G. Belling, T. Dixon, jun. (Hon. Sec.), and one visitor.

OSAGE ORANGE.—Mr. E. J. Herbert read a clipping from a newspaper, showing the value of Osage orange (*Maclura aurantiaca*) for fence posts and as a hedge. If planted at 10ft. to 15ft. apart they will become trees, and when cut for posts the stumps will soon reproduce two or more fresh trees. The posts last good for an indefinite period.

AGRICULTURAL EXPERIENCE: PAST AND PRESENT.—Mr. Pridham read a paper to the following effect:—

Observers of to-day would scarcely credit the difference between the work of the agriculturist of fifty years ago and that of to-day. The old wooden plough, with one wheel, and some with no wheel, drawn by six and eight bullocks, having a share weighing over 4cwt., which took a blacksmith and striker one whole day to manufacture, at a cost of £1 10s. to £1 15s. This share frequently had to be carried on foot from three to eight miles for the purpose of being sharpened and relaid at a cost of from 1s. to 5s. Then it required two strong fellows to perform with this monstrous implement; one had to hold fast to the plough handles to keep it in position, which was no easy matter, especially when coming in contact with a stump or boulder. I have been thrown clean away from the furrow. Then the bullockdriver would frequently be careless in his work, and allow his team to get considerably out of position, evoking no small dispraise from the person in charge of the plough handles, occasionally followed by a great clod of earth. Great is the contrast indeed of fifty years ago and to-day, where the ploughman and driver are combined in one. After the ploughing came the seed-sowing, which was performed on foot. The sower carried a large box, made of wood or tin, with a strap over one shoulder. This being filled with wheat, the sower would stride off over clods, and often mud, sowing the seed as he went. The quantity of seed wheat sown was about 1bush. per acre in the early part of the season, increased as the seed time advanced in some cases to 1½bush., and the average returns would be considered low if under 20bush. per acre, but I have known as low as 3bush. and as high as 45bush. to have been harvested, the difference being due to deficient or abundant rainfall. The sickle in those days was the principal implement used in taking off the corn, as well as cutting fingers and trouser

legs. The cockspur, too, was conspicuous in those days, when the fingers and hands suffered considerably. After the wheat had stood in shocks a time, being considerably thrashed by opossums and cockatoos, what was left would be carted into stacks. Thrashing.—This work was performed in various ways—thrashing out with bullocks; rolling out with a large log roller, large at the outer end and small at the inner end, fastened or confined to a centre pin as an axis, and on the large end was a centre pin with ring, on which the draught would be confined for the purpose of drawing this log around in a circle over the corn until it was knocked out of the straw; other with small quantities usually knocked out their wheat with the flail; but eventually the thrashing machine was introduced into the field. In England the harvest field was looked forward to not only as a field of labor, but also of jollification. Men, women, and children were present in great numbers. My mother thought she would keep up the old practice, and manufactured a cask of sugar beer from hops, sugar, and barley. The beer cask was sent to the stack, a mile from the house, where everyone could help himself, and before midday there were only two persons left standing, the balance being dead drunk. That was the first and positively the last time that such an event occurred. The thrashing machine travelled from farm to farm, and thrashed each farmer's corn in rotation, which was generally got through in fairly good order, but the work connected with its operation was neither easy nor pleasant. Prices for wheat were then much higher than at present. I have known those who, when they were offered 20s. per bushel for their grain, wanted 21s., but took much less in the end, the ruling price being about 10s. per bushel. The reaping machine, or what is now termed the stripper, was one of the earliest inventions—a peculiar implement indeed, the steering wheel being fixed behind, the rising and falling being done by two men walking and lifting front and inserting pin until shifting would be again necessary. This machine succeeded so well that Adamson conceived the required idea which is still in use—rising and falling with screw gear—only it is on a much better plan. I well remember one of Adamson's old wooden barges. The wheels and frame work were of the very best blue-gum procurable, and of such dimensions as would astonish the present generation. The driving or crown wheel with all its gear was very little, if anything, short of half a ton; front carriage wheel was as heavy as the crown of to-day; axle and axle bed, which went through the box, was about the weight of an ordinary stripper of to-day; the box being built of wood, and contained space sufficient for an ordinary dwelling-house. The crown was put together in sections, as felloes, with cogs on back, which of course necessitated working cross belt. This very frequently would leave its position, get rolled up in the cogs, get well cut about as a result, and would spoil half a day in getting belt out from its awkward position. In working this machine it was found necessary to halt once, or even twice, while going the length of a section (which was 28 chains), and back for the purpose of climbing on top and opening the trap door, get inside, and fork back the wheat from the front of axle bed to make room for the rest. In front of platform was a large block of wood, acrossways, in which was driven three large iron spikes to serve as steering pressure, the steering bar being linked to front carriage, on which were chained eight or ten bullocks, so that the steerer had to press against the draught of that number of oxen. It was not long, however, before an improvement was observable. It was found that this machine could safely be reduced in weight, and many other faults improved by Adamson, while other minds were studying the requirements of the near future when Mellor came into the field of machinist and sent out quite a new addition, a machine that was of very light build, mounted with shafts for one horse, which carried the captain with operating gear. This machine was worked with three horses in a string, which also necessitated a driver. From that day to the present there has been some improvement added to this harvesting machine, which, I think, is as near perfection as can be reasonably expected. Winnowing machines were simple from the beginning, did their work satisfactorily, only required an extra hand to work, as the spike roller was not at first introduced, and therefore required a feeder to regulate the passage of the corn through the winnower, which was termed chaffing; then the wheat was put through the second time before being sent to market. The treatment of seed wheat before sowing, in the early days, was precisely the same as at present. Bunt and smut existed in small quantities as at present, and the wheatgrower was satisfied that if he picked his wheat it was all right. Often it was done in the morning, taken out and sown while damp. If there was any smut in the future crop it was it was not often much; there was generally more anxiety about drake than smut. There were many other disasters and conditions which overtook the crops, which caused much greater losses than smut. In the year 1868 we were visited by the red rust plague. Up to that date this wheat disease was unheard of. Being a fairly wet season there were some fairly good crops growing, and it was not known by a great many that there was anything wrong with the crops until starting the stripper, when, to their surprise and sorrow, it was found that the ears contained no corn in many cases, and in the best-filled heads it was very poor, being not more than half grain. No one could state a positive reason why the crops were so affected. Some of the more superstitious old boys declared that it was the vengeance of the Almighty poured out upon the land as a punishment for their extravagance in connection with the visit of His Royal Highness the Duke of

Edinburgh to these shores. Some thought it was excessive moisture at heading time—a lack of hot winds which was thought necessary to carry off the steaming heat which was considered to be the origin of the destroying parasite. Black rust was also in existence, but was a much less destructive disease, generally confined to the early-sown wheat after the second or third crop had been taken off the land, principally in black soil which was sown when in a dry state; land that was sown later in a moist condition being almost, if not entirely, free from that disease. Takeall also made its appearance in patches—large patches too in some cases. This disease was usually confined to fallow land which had been sown before there had been a fall of rain sufficient to moisten the soil plough deep. Farmers thought that fallowing was the origin of takeall, as land ploughed and sown at once was not so affected, so they preferred waiting for the rain and then put the plough at work and proceeded with seeding; the reason then for takeall being so bad in fallow was chiefly due to sowing the seed when the land was in a dry condition, as the fallow was always the first land to be sown. Dead heads were noticeable occasionally, but no very great loss was experienced that way, so no particular reason was assigned for their appearance. In those days there were many other ways in which the grower suffered considerable loss of his crop. There were the hot winds, the rain storms at harvest time, and many minor losses during the growing season, as is the case of to-day, but for all that they made progress, because the price obtained for produce was equivalent to its producing cost. They were in a position to send their sons into the more northern country, where, in the seventies, a great many did well, and have been placed in a position to retire from the field and hand over their holdings to their sons, who must now chew the comb from which the honey has been taken. Manuring land in the early days was limited; the only fertiliser then used was farmyard manure, which could not be produced in sufficient quantities to manure many acres of land. Notwithstanding, a good many tons of farmyard manure found its way into the land, and proved its power of increasing the yield when assisted with a favorable rainfall. Wheat straw was considered to be a good fodder for cattle in winter, when other feed was scarce, and some care was taken to conserve that article in stacks for a rainy day, although it was not cared for on such a scale as circumstances sometimes demanded. Hay, of course, was considered to be the best fodder for stock, and was provided liberally, as a rule, notwithstanding the harvesting of hay being a very laborious process (the cutting performed with the scythe); it would astonish the fieldsman of to-day to see the quantity of stuff knocked down with such a weapon by one person in one harvest. I have cut as much as seventy acres in one harvest; crop averaging over 1 ton per acre. After the cutting each swathe had to be forked up separately with a pitchfork into cocks and the land gone over with a drag rake, which was composed of wood and drawn by handpower, which the young agriculturist of to-day knows nothing about. The practice of the agriculturist of to-day is ride on the plough, ride on or after the harrow, ride on the roller, ride on the scarifier, ride on the seed sower, ride on the mower, ride on the rake, ride on the stripper, and would ride on the winnower only for fear of getting a scalp wound. He rides on the wagon, and also his bike.

In discussion, Mr. Pridham said he had known a farmer to get a living off forty acres in the early days. The farmer of to-day lived a gentleman's life, riding on the seats of his implements, as compared with the drudgery of the old times with bullock teams and single-furrow ploughs. Members attributed the absence of drake or darnel to the fact that land is now generally cropped only once in three years, whereas in the old time the land was cropped for several years in succession, and the seeds of drake, being small, dropped, germinated, and increased each season, instead of being destroyed by fallowing.

ANNUAL REPORT.—The Hon. Secretary reported twelve meetings holden during past year with a good average attendance of members. Several very practical and interesting papers have been read and discussed, and altogether a useful year's work has been done.

OFFICERS.—Retiring officers were thanked. Mr. James Nicholls was elected Chairman, Mr. J. W. Dall Vice-chairman, and H. J. Spencer Hon. Sec.

Hawker, June 26.

Present—Messrs. H. M. Borgas (chair), F. C. Hirsch, R. Wardle, A. C. Hirsch, J. O'Loughlin, S. Irvine, and J. Smith (Hon. Sec.).

COST OF WHEAT-GROWING.—Mr. J. Smith gave an estimate of cost of wheat-growing as applied to the bluebush and slaty soils of this locality. It was of course impossible to give any definite figures, as soil, season, and location affect

the cost. He put the average cost at 13s. 4d. per acre, based on an 8bush. yield, and made up as follows:—Fallowing, 4s. 6d.; preparing seed bed, 2s.; sowing and covering seed, 3s.; reaping, 3s.; cleaning, 10d. Mr. Laidlaw thought these figures too high; the items for labor could be reduced and the cost brought down to 12s. 6d. per acre.

PROFESSOR LOWRIE.—Members expressed regret at the resignation of Professor Lowrie, and were of opinion that his removal was a distinct loss to the State.

HORSE COMPLAINT.—Mr. F. C. Hirsch reported his horses to be suffering from some peculiar ailment. Although they looked to be in good health they were incapable of doing any work. Their droppings were quite hard and dry. When they got down they were unable to rise without assistance. There was no appearance of cold, and one that had died and was opened showed no sign of disease inside. He had fed them on hay chaff mixed with bran, soaked wheat, and pollard, and had also given salts, injections of soapsuds, &c., but found nothing of any effect on the character of the droppings. Green feed and bran mash did no good.

Meadows, July 1.

Present—Messrs. T. B. Brooks (chair). G. Ellis, T. A. Buttery, T. Usher, F. W. Vickery, F. W. Dohnt, B. Brown, W. Nicholl, J. Catt, D. D. Murphy (Hon. Sec.), and two visitors.

WATTLE CULTIVATION.—Mr. F. W. Vickery read the following paper on this subject:—

The broad-leaved wattle (*Acacia pycnantha*) which is indigenous to South Australia, and particularly to this district, is without doubt the richest of all the acacia tribe in tannic acid, and may be put down as containing from 20 per cent. to 30 per cent. of tannic acid, according to the locality upon which it is grown, and the suitableness of the soil for its production. The first consideration of every grower of wattles should be the selection of seed. Always secure it from the finest specimen tree available, and, having got the seed, sift out all the small grains, saving only the largest and plumpest. There are over 30,000 grains in every pound weight of seed. The seed is extremely hard and often remains in the ground for years without germinating; this may be overcome to a great extent by the application of boiling water. Upon 1lb. weight of seed pour 1gal. of boiling water and let it stand until it cools; it will then generally germinate fairly well. Country that has grown wattles naturally will be so well supplied with seed as to require no artificial sowing, and there is nothing better than burning the country to ensure a big growth. It seems a very simple thing to say "Burn the country," but there are burns and burns. When you burn, do it thoroughly; drag together all the logs you can and make a clean sweep. You will be well repaid for your extra trouble; the result will be in all probability a crop far greater than the country can carry; thinning out must then be resorted to. Like every other growth, if you want fine trees you must give them room, and I am convinced by practical experience that 8ft. apart is none too much space. This will give, in round numbers, about 900 trees per acre. Two furrows thrown one against the other, and the seed dibbed in between, I have known most successful. More than 900 seeds may be safely planted to the acre; they should be thinned out to about that number. After the trees have assumed certain dimensions, I am greatly in favor of pruning, but there is a great diversity of opinion on this subject; judgment should always be exercised. Great economy in the cost of stripping is effected by having a big long barrel to strip from. The time of year for stripping depends almost entirely on rainfall and climatic influences; choose hot, dry weather if possible. Lay your bark out to dry in thin layers, turn it frequently, keep it as much as possible in shade; this greatly improves the color. When thoroughly dry, tie it up in neat bundles bound with yarn; great loss is occasioned in loading and unloading by bad tying. In the end you will always get a better price for well-dried and tied bark than you will for a badly got-up sample. First-rate results have followed the clearing of stringy bark forests, and some of the finest trees in this district are growing on land so treated. Ring all the big trees, and, when the leaves have fallen, hand-cast the country with seed and burn it. When the young plants begin to exhibit themselves, thin out according to judgment; do not spare them is my advice. A mattock is the best tool for this purpose. It may be taken as an almost invariable rule that the young plant showing

the most vigor, and having the largest and fattest second leaf, will make the finest tree. The wattle likes a good rainfall, but will not thrive on badly-drained, sodden ground; on the Bay of Biscay land it is always observable that trees grow on the ledge and seldom become fine trees. Sheep should not be depastured on a wattle plantation during first two years at any rate; other stock do but little harm. This need hardly be taken into consideration, as when country is given up to wattle culture but little else grows, and that not worth having. The variety of wattle most suitable must be left to the observation of the grower. In many parts of this district, particularly on the ironstone ridges about Macclesfield, a stunted bushy tree grows, the bark of which looks as though it had been tightly bound with wire about every 10in. The bark of this tree strips badly owing to its brittleness, but is greatly liked by the tanner, and was greatly sought after by Messrs. Borrowes and Haycraft at the extract works at Echunga. The growth of this species might be greatly improved by change of situation, and is well worthy of any grower's attention. All Silver and other barked spindly wattles should be destroyed. The *Acacia prunosa* that beautifies so many of the gardens about Mount Barker and elsewhere is very lovely. It has its place, and that is in the garden, and not the profit-growing plantation. The bark is like paper and thick bark and plenty of it should be the sole aim of every cultivator. The worst enemy the wattle has is fire, and I would strongly recommend some united action that would minimise the risk. Every grower should be bound to keep fire-breaks clear around his plantation. If this were systematically done it would be easier to insure crops against fire. One careless man is a menace to the whole district. It is greatly to be deplored that that splendid undertaking of Borrow and Haycraft, before referred to, came to an end; there was then profitable outlet for all the waste after stripping and thinning, thereby greatly lessening the risk from fire. Wattle-growing need not be confined to the plantation pure and simple—it can be most profitably resorted to as an auxiliary to other kinds of cultivation. There is nearly always some land about a farm that could be spared for the purpose, and I would strongly recommend cultivating the inclination of children to the growth; it would always be growing while they were sleeping, and might produce a healthy competition productive of highly favorable results. There is every reason to say that bark will hold its price, and comparing the profits attending its cultivation with those of the commodities of the district, I cannot too strongly impress upon growers the good old adage that "What's worth doing at all is worth doing well." It was held for many years by experts that wattle trees would be fit to strip at five years old. That may be looked upon as an exploded idea; certainly a light stripping may be got at the end of that time, but it will surely be at the expense of the future; the early growth is very slow except in certain very exceptional cases. I think it is safer to say that eight years must elapse between sowing and stripping. It is not amiss when walking about your farm, or paddock, to have a small supply of seed in your pocket. You can nearly always find a suitable place for dropping a seed or two and stamping them into the ground. Frost is more or less destructive to young plants, and a badly frost-bitten plant may as well be chopped out; it never would grow into a fine tree. To show importance of wattle industry, it may be stated that in 1900 8,386 tons, valued at £63,732, were exported, in addition to which 4,000 tons were used in the colony. Members thought it inadvisable to remove all trees from stringybark country, as the young plants are so much injured by frost.

Gumeracha, July 1.

Present—Messrs. D. Hanna (chair), J. Monfries, W. Jamieson, A. E. Lee, W. A. Lee, H. W. Nosworthy, W. V. Bond, W. Cornish, and T. W. Martin (Hon. Sec.).

CONGRESS.—It was decided that the delegate from Gumeracha Branch should move the following motion at Congress—"That the member representing each district at the Annual Congress should have his fare paid by the Government," and also urge at the same time that the Government should pay the fares of all members appointed to attend the Annual Congress. [Congress once a year would then cost more than the whole other work of the Bureau.—GEN. SEC.]

CENTRAL BUREAU MEETINGS.—Members wish to know whether any member of a Branch Bureau can attend the meetings of the Central Bureau as a visitor. [Yes.—GEN. SEC.] It was resolved that this Branch strongly objects to the remarks made by the General Secretary and some members of the Central

Bureau, as reported in the *Register*, that the Gumeracha Branch was "dead" or "sleeping." [Neither the General Secretary nor any member of the Central Bureau in any way connected the Gumeracha Branch with the remarks concerning certain Branches which appeared to exist only to secure the *Journal of Agriculture* and other privileges from the department. Were all our Branches as active as the Gumeracha Branch we would have nothing to find fault with.—GEN. SEC.]

PROFESSOR LOWRIE.—It was resolved that this Branch deeply regrets the resignation of Professor Lowrie, and wishes him every success in his new sphere of labor.

MANURES.—The question of heavy *versus* light dressings of manure was discussed. All were agreed that the difficulty in this district was to get enough manure; the more manure used the better the crops. This district does not suffer from blighting effects of hot winds.

Elbow Hill, July 2.

Present—Messrs. H. T. Styles (chair), E. Wake, C. G. Ward, J. Rhen, W. Ward, J. Harvey, H. Dunn, G. C. Dunn (Hon. Sec.), and two visitors.

OFFICERS.—Mr. H. T. Styles was re-elected Chairman, and Messrs. E. Wake and G. C. Dunn elected Vice-chairman and Hon. Secretary respectively, the retiring officers being thanked for their services. Regret was expressed at the retirement of the late Hon. Secretary through illness.

DAIRYING.—It was decided that the question of purchasing a bull of good dairying breed be left to the delegates attending the Annual Congress.

FOWL COMPLAINT.—A member reported that his fowls were suffering from some complaint. Lumps come on the ears and a red ring round the eyes, blindness eventually following. Members suggested free use of lime and sulphur.

FARM PRODUCE.—The Chairman thought there was a good opening for a collector of farm produce in this district.

PROFESSOR LOWRIE.—Regret was expressed at the resignation of Professor Lowrie.

Arthurton, June 21.

Present—Messrs. W. H. Hawke (chair), W. Short, J. Koch, T. B. Wicks, M. Lomman, C. L. Palm, J. Pearson, M. Baldock, H. Baldock, T. Baldock, H. J. Freeman, S. T. Lamshed, W. E. Hawke, J. B. Rowe (Hon. Sec.), and six visitors.

HOMESTEAD MEETING.—This meeting was held at the residence of the Hon. Secretary, and the opportunity was taken to inspect the anti-clog weeder and cultivator at work. It was generally admitted that the weeder would be greatly improved by widening it from 7ft. 6in. to 10ft. Mr. Koch invited members to meet at his residence on occasion of their next meeting.

FOWL COMPLAINT.—Mr. Palm reported that he had used Condry's fluid with very satisfactory results for disease in fowls (roup) reported at April meeting.

CATTLE COMPLAINTS.—Bute Branch wrote *re* cure for stiffness and impaction in cattle. A resident of the district was in possession of an alleged cure for same, and was prepared to sell the recipe for £50. It was suggested that half the amount should be raised by the Branches and half paid by the Government. Members were in sympathy with the proposal, but would like to have the remedy first tested. The Hon. Secretary was instructed to obtain sufficient medicine for two cows.

OFFICERS—Mr. W. H. Hawke was re-elected Chairman and Mr. C. L. Palm elected Hon. Secretary for ensuing year,

FALLOWING.—Mr. W. E. Hawke read a paper on this subject as follows:—

Most farmers in this district have begun fallowing, proving that in their opinion fallowing is profitable, and that early fallowing is preferable to late fallowing. When fallowing was first advocated we were mostly doubtful of its paying, and the results were certainly very variable. But we must remember we waited until spring to turn over the ground in order to save horse feeding, getting as a consequence dry fallow and takeall in the crops. Since early fallowing has become the general practice it has been uniformly successful. Having proved to our satisfaction that early fallowing pays, we next require to consider the after treatment of the land. On this point opinions differ. Some prefer to harrow it down fine at once, and then feed down the weeds with sheep. Others are continually stirring the land with cultivator, harrows, or plough, or perhaps all three. Others again do not touch the land either with implements or stock until seeding time, and yet get good crops. Now the question for us is—“Is cultivating or stirring the fallow as beneficial as keeping it clean by means of sheep?” Personally, I do not think so. We fallow early to conserve moisture in order that it may, with the acids in the soil and air, dissolve and render soluble the plant food in the soil. Now if the soil is stirred and turned over from time to time during the summer months, or even after the bulk of the winter rains have fallen, it follows that a large amount of moisture is lost by evaporation, and the usefulness of fallowing is thereby decreased. Against this, however, with fallow land that is cultivated during summer there is the advantage, and no mean one, of being able to get our seeding over in so much quicker time than is the case if the fallows have been only grazed. The latter must be ploughed again, whereas the former can be drilled straight away, or at the most will only require the use of the cultivator, with which implement they could do twice the area with half the strength required for ploughing. This is always a great consideration at seeding, when as a rule every animal possible is pressed into service in order to get the crop in. In dealing with this question there are many points to be considered—the condition of the fences, the size of the paddocks, the ratio of fallow to the area of the farm, the relative prices of mutton, wool, and wheat. These are all factors in determining which method should be adopted by the individual. No hard and fast rules can be laid down. There is one point often missed in connection with the feeding down of fallows with sheep—the land must be ploughed again to allow of drilling in the seed. The soil will remain fairly loose throughout winter and harvest time, allowing of the stubble land being drilled in again the following season without any further preparation. We would thus obtain two crops in four years, instead of one crop in three, as at present. This, in my opinion, would prove more profitable, as with the extra work and expense in fallowing, manuring, and drilling in the seed, one crop every three years is not sufficient recompense for toil and risks incurred unless the season proves exceptionally favorable.

Considerable discussion ensued. Mr. Freeman held that the more the surface of the fallowed land was worked the better the moisture would be retained, and he could not agree with the writer on this point. Mr. Rowe thought the reference to loss of moisture was in deep cultivation during the summer, which would continually expose the moist soil to drying influences of wind and sun. Members agreed largely with the contentions of the paper. Mr. Wicks strongly agreed with paper; if he were to cultivate his fallows during summer it would all blow away, it being of a sandy nature. Mr. Short asked what was early fallowing? Members considered the work should be finished before the middle of August; September was too late.

Robertstown, July 1.

Present—Messrs. N. Westphalen (chair), H. Kotz, W. Mosey, J. E. Milde, and S. Carter (Hon. Sec.).

OFFICERS.—Messrs. N. Westphalen and S. Carter were re-elected Chairman and Hon. Secretary respectively.

LESSONS TO BE LEARNED FROM THE DROUGHT.—Mr. Westphalen read a paper on this subject, as follows:—

The effects of the late severe drought are both seen and felt by farmers and stockowners in this district. We all recollect that a great number of good working horses and nice herds of cattle, together with thousands of sheep, actually starved to death. Many farmers, after

twenty years' residence in the district, are no better off now than they were when they settled here first; and it is probable that another twenty years more will not improve their position unless they change the method of working their farms. We all know that the good seasons are not so frequent as seasons of drought and scarcity, but farmers should try and follow the example of Joseph in the time of Pharaoh, and make ample provisions during the period of plenty. If we do get a good season there are thousands of tons of fodder lying to waste. Instead of conserving all available fodder the farmers endeavor to increase the number of stock, and consider they have done well, but if the next season sets in dry, with very little or no feed at all, they find they have too many stock, and must dispose of some of them for probably half their value, or else lose them through starvation. My idea is not to keep too many animals, and whenever there is a good season to save and store all fodder available—if possible sufficient to carry on over another dry season. The majority of our farmers, if not all, must plead guilty of neglecting this matter. On many farms little or no hay is cut, the owners trusting to pull through with cocky chaff and the wheat screenings. A haystack a year old is a rarity, and this ought not to be so. How best to avert losses in future I wish to submit the following points for consideration:—Cutting and binding part of the crop for thrashing or heading. Having practised this method for a number of years I can speak from my own experience, and take this opportunity of recommending it. The crop should be cut ten or twelve days before ripe, and be headed. Another great advantage of this plan is we escape a lot of risk of damage by storms and hot winds. If no header is available, cut the heads off and run them through the drum of your reaper. This is preferable to heading if fed loose to cattle; but for chaffing the header is best. The straw should be stacked at once, and can be greatly improved by sprinkling a little water and salt on each layer. The straw will then be of use for fodder, and if not required for the next season can be kept good till it is required. All cocky chaff should be housed before any rain falls, because if a little damp it heats very quickly, but dry and well conserved, all stock will eat, and if not required will keep good for another year. Ensilage, I would advise all farmers, especially those keeping dairy cows, to make. All surplus of wild oats, grass, and herbage, could be used. The oats and grasses should be cut green, when well out in ear, and stacked at once. If left in the paddock to ripen it is of little value, but is much relished by all stock in winter time if made into ensilage, and they prefer this to good outen hay. My opinion is that dairying will never pay until ensilage is used in every dairy; and I consider in dairying lies the prosperity of Australia. Every extra shilling taken from the land is adding to the wealth of the State. To neglect such provisions when it can be done, I say is shameful; and people who have an objection to do so should have no stock to starve. I can assure you there is money in conservation of fodder.

Baroota Whim, June 29.

Present—Messrs. F. H. Flugge (chair), F. C. Bessen, A. Spencer, A. Raneberg, and C. W. Hoskin (Hon. Sec.).

CONGRESS.—The Chairman undertook to read a paper at forthcoming Congress on "The Benefits of Keeping Sheep on the Farm." Members were of opinion that the proposal to hold next Annual Conference of Northern Branches at Crystal Brook instead of Gladstone would suit the convenience of members of Branches west of the Flinders Range.

PREMATURE RIPENING OF CROPS.—Owing to the dry weather the early-sown crops are running up to head too soon, and are not stooling out. Feed also is backward.

Morphett Vale, June 5.

Present—Messrs. L. F. Christie (chair), H. Smith, E. Perry, A. Jones, J. Bain, A. Pocock, J. Dpledge, F. Pocock, G. Goldsmith, J. McLeod, and A. Ross Reid (Hon. Sec.).

BLOAT IN COWS.—It was stated that a certain cure for this complaint was a tablespoonful of ordinary soda (carbonate of soda) in a pint of water. [Quite correct.—GEN. SEC.]

WATERING HORSES.—Mr. Jones read clipping from *Australasian* on the stomach of the horse. The principal lesson gained from it was that when a horse drinks the water it at once passes into the smaller intestines, so that if a horse

takes a good drink after a feed it may wash a large quantity of food into the smaller intestines before it is properly digested. Mr. Smith said he would rather drive a horse thirsty than allow it to drink just before starting on a journey.

OFFICERS.—Messrs. H. Smith and J. Bain were elected Chairman and Vice-chairman respectively, and Mr. A. Ross Reid re-elected Hon. Secretary, the retiring officers being thanked for their services.

PROFESSOR LOWRIE.—Regret was expressed at the resignation of Professor Lowrie, members mentioning their personal gain from the adoption of his advice.

MANURES AND SEED DRILLS.—Mr. Smith believed that he was the first to use a combined seed and fertiliser drill in South Australia, and that Mr. Charles Rake, of Enfield, was the first to use superphosphate. [If dates were given there would be some means of settling this point.—GEN. SEC.]

ROLLING AND HARROWING GROWING CROPS.—The Hon. Secretary asked whether, with sandy lands in good condition and fallowed, it was advisable to roll the crops. Members generally were in favor of rolling as soon as the crop was high enough, in order to keep the sand from drifting. Mr. Pocock asked, "Does it pay to harrow growing crops?" Mr. Hutchinson found it beneficial to harrow peas. Mr. Smith's experience of harrowing cereal crops was unsatisfactory, and he would not advise anyone to do more than try it on a small plot.

FALLOWING.—Members agreed that late fallowing was beneficial, but it was far more satisfactory to fallow early, and to keep the land in good order and free from weeds. Mr. Smith said the fallow could not be worked too much. He had once cultivated a fallow paddock sixteen times, and cut 3 tons 6cwts. of hay per acre as a result.

WEEDS.—The Hon. Secretary moved that it was a mistake to force landowners to cut up the common star thistle (*Centaurea calcitrapa*) and the wild onion (*Asphodelus fistulosus*). This was carried with only two dissentients. Members stated that stock of all kinds were taking to eating the wild onion, and that the star thistle was a first-class sheep feed. Mr. Smith said he had been cutting up the wild onion for years, but it was thicker than where it had not been touched. His experience was that most of these weeds die out in time if left alone. [It would be most interesting to learn the names of any weeds or other pests that have disappeared or even failed to increase when left severely alone.—GEN. SEC.]

Boothby, July 2.

Present—Messrs. F. J. White (chair), G. T. Way, F. R. Way, R. Chaplin, R. M. B. White, T. Sims, F. A. Foulds, G. S. Robinson, E. Bradley, R. Carn (Hon. Sec.), and five visitors.

AMERICAN BRONZE TURKEYS.—Mr. W. T. Mortlock, M.P., having presented some bronze turkeys to the Branch, the Hon. Secretary was requested to write him a letter of thanks.

YORKSHIRE WHITE PIGS.—An offer having been made of a pure Yorkshire white boar at a reasonable price, it was resolved to purchase same for improving breed of pigs in the district.

SHEEP ON FARMS.—Mr. G. T. Way said sheep are profitable, notwithstanding the ravages of dingoes. Mr. Foulds said if the poor lands can be cleared and improved by the use of fertilisers the dingoes could be more easily destroyed. Mr. Flowers had introduced ideas that were good and worthy of careful consideration. Mr. Bradley said what the farmer gained on sheep is lost upon other stock. Mr. Sims and Mr. Robinson thought the risks with sheep are too great in this district. Mr. Way advocated moderate-sized paddocks, when sheep

will pay better than other stock; profits come in quickly if the holding is not over-stocked. The Chairman said 100 sheep would pay better than ten cows, and gave much less trouble; but Mr. Bradley said the ten cows would give the most profit. The majority of votes was in favor of sheep.

FERTILISERS.—Mr. Way wished to know whether the whole of the land at the Roseworthy Agricultural College was treated with 2cwts. super. per acre, or was it only on small experimental plots? [The Professor of Agriculture has proved to his entire satisfaction that it pays better to use 2cwts. of super. per acre than any smaller quantity, and therefore he would naturally use the larger quantities, except upon the plots where he is carrying on experiments.—GEN. SEC.] Mr. Foulds said there appeared to be a difference of opinion between some farmers and the Professor with respect to the manure blighting the crops, the farmers contending that the super. tends to blight, whilst the Professor says that it helps to retain the moisture in the soil, causing the crop to ripen more quickly and not to blight it. Mr. T. Sims is trying a number of experiments in manuring and will report results later on. Mr. Way wished to know how much farmyard manure would give an equivalent to 1cwt. of superphosphate per acre, and was told that 4cwts. or 5cwts. would be about the amount. [There can be no comparison made between the two. Super. consists only of phosphoric acid and lime, with a good proportion of sulphur in combination with the lime abstracted from the “insoluble-in-water” bone or mineral phosphate, whilst the farmyard manure consists of a multitude of matters, such as nitrogen, potash, phosphoric acid, &c. One ton of farmyard manure would contain about 6lbs. to 9lbs. phosphoric acid, whereas 1cwt. of superphosphate will contain about 20lbs.—GEN. SEC.] It was agreed to co-operate to purchase a large parcel of super.

BEST WHEAT FOR HAY.—Mr. Chaplin said the best wheats for hay are Blount's Lambrigg, White Tuscan, Leak's Rustproof, and are rust resistant, though rather slow in growth. They should be sown early. Early Para is good for hay, and may be sown later, as it grows more quickly.

OFFICERS.—Office-bearers for past year were thanked. Mr. F. T. Whyte was re-elected Chairman, Messrs. J. A. Foulds and T. Sims elected Vice-chairmen, and Mr. G. T. Way Hon. Sec.

Wilmington, July 1.

Present—Messrs. William Slec (chair), M. Gray, J. Schuppan, J. Zimmermann, T. Carter, J. Hannigan, J. Lauterbach, H. Noll, and R. G. S. Payne (Hon. Sec.).

OFFICERS.—Officers were thanked for past services. Mr. J. Hutchins elected Chairman; Mr. William Slec, Vice-chairman; and Mr. R. G. S. Payne, re-elected Hon. Sec.

CONGRESS.—Hon. Secretary promised to prepare and Mr. Gray to read paper at Congress during show week, in September, on “Agricultural Interests in the Northern Districts.”

SHEEP ON SMALL AREAS.—Mr. Noll had only just commenced to keep sheep, and the dry season had compelled him to feed them; but he believed there would be a fair margin of profit if nothing further happened. Mr. W. Slec was perfectly satisfied that there is profit in keeping sheep on farms. He had no reason to regret having done so. They were very useful in clearing off weeds from fallowed land. Mr. Schuppan thought sheep would eat feed that could be more profitably used by cows. Mr. Slec said a farmer cannot profitably keep sheep unless his farm is suitably divided and made sheep-proof. Mr. H. Noll said he had kept 150 sheep shut up in a small area of land, giving them each 1lb. chaff per day, and they had improved in condition, whilst 100 head, having the same quantity, but allowed to roam over the stubble, lost condition.

Stockport, July 2.

Present—Messrs. J. F. Godfree (chair), C. W. Smith, D. G. Stribling, J. Smith, J. Smith, jun., T. Howard, F. Watts, G. Thomas, and J. Murray (Hon Sec.).

ANNUAL REPORT.—The Hon. Secretary read his ninth annual report. Thirteen meetings had been called, of which two failed for want of a quorum. The Chairman and Hon. Secretary had attended every meeting called, and the average attendance for the whole of the members was nearly nine. A few papers had been read, and many useful subjects reported upon and discussed. A field trial of ploughs had been holden, and the annual picnic had taken place. The funds showed a balance in hand of 11s. 10d.

BUSINESS.—Members blamed themselves or rather each other.—**GEN. SEC.]** that only two papers had been read during the year, and they resolved to take it in turn to furnish a paper at each meeting. A ballot was taken at once to fix the order in which the papers are to be prepared.

MANURE AND FRUIT TREES.—Mr. C. W. Smith wishes to learn what kind of manure is most suitable for fruit trees, and when is the best time to apply it. [This depends upon the nature of the soil and the deficiencies that may occur in respect to the plant food therein. As a rule potash and phosphoric acid do the most good, but in many cases a nitrogenous manure may be required. Probably the best time to apply manures - when wanted—would be after the leaves have fallen from deciduous trees.—**GEN. SEC.]**

OFFICERS.—Officers were thanked, and Mr. G. S. G. Thomas was elected Chairman, F. Watts Vice-chairman, and J. Murray re-elected Hon. Secretary.

Golden Grove, July 4.

Present—Messrs. J. R. Smart (chair), T. G. McPharlin, J. Ross, F. Buder, W. Mount-Stephen, J. Woodhead, and J. R. Coles (Hon. Sec.).

WATERING HORSES.—Members are of the opinion that no hard and fast rule can be maintained in reference to watering horses. Most farmers allow their horses to go straight from the field to water. Along the road it is thought advisable to allow a horse to drink as often as he may require, taking care he does not drink too much. Mr. Ross gives his horses a little food before letting them have a drink.

Tatiara, July 8.

Present—Messrs. W. E. Fisher (chair), A. D. Handyside, M.P., J. Rankine, R. Penny, C. H. Wiese, and T. Stanton (Hon. Sec.).

USE OF FERTILISERS.—Mr. Rankine said he started using super. at the rate of about 50lbs. per acre, but increased the quantity each year until he now had drilled in 112lbs. per acre with the seed, and he believed the heavier the dressing given the better it paid.

WOOL-SORTING.—Decided to request Mr. Geo. Jeffrey (Wool Instructor at the School of Mines) to form a class at Bordertown during October, members undertaking to find fleeces. [Mr. Jeffrey tells me that he proposes to comply with this request.—**GEN. SEC.]**

HORSE-BREEDING.—Members would like to have the rule on railway lines of Victoria adopted in South Australia. Clause 7 on page 74 of the Victorian Railways Merchandise Guide provides for the conveyance of mares to the nearest station for a stallion at reduced rates.

Pine Forest, June 25.

Present—Messrs. J. Phillis (chair), W. H. Jettner, E. Masters, W. Kempster, and R. Barr (Hon. Sec.).

DRAUGHT STALLIONS.—Committee reported result of inquiries *re* cost of procuring a good sound draught stallion for use in the district, cost of keep, probable profits, &c., and after a good deal of discussion, which merged into the question of improving the draught stock of the district, it was finally concluded that private ownership of the stallion is preferable when good stock is desired. A good deal of emphasis was laid on the matter of properly feeding young stock, instead of leaving them to forage for themselves, which tends to throw discredit on the best of sires.

COMBINED BRANCHES SHOW.—Delegates to the meetings at Port Broughton reported that it had been decided to discontinue the shows. It was decided that a show of four or five classes of exhibits shall be holden in connection with the next Conference of Northern Yorke's Peninsula Branches, and that the "show pictures" now on hand be thus disposed of.

PROFESSOR LOWRIE.—This Branch desires to express its hearty appreciation of the valuable services to the agricultural interests rendered by Professor Lowrie, and deeply regrets his departure from South Australia.

Morgan, June 29.

Present—Messrs. R. Windebank (chair), H. Hahn, R. Wohling, H. H. Plummer, G. Schell, C. Moll, C. F. W. Pfitzner, T. T. Schell, W. G. F. Plummer, G. Ruediger, E. French (Hon. Sec.), and five visitors.

SHEEP ON FARMS.—Mr. C. F. W. Pfitzner is satisfied that impaction in any kind of live stock will never occur where sheep are kept running.

THE DECIMAL SYSTEM.—The members of this Branch are desirous to secure the adoption of a uniform "bushel" weight of 50lbs. for all grain, bran, pollard, &c.

PAPER.—The Hon. Secretary read a paper on "How to Use the Murray Water to Advantage," in which he advocated the establishment of an irrigation colony in an advantageous position.

Eudunda, July 1.

Present—Messrs. F. W. Paech (chair), W. F. Sieber, E. T. Kunoth, H. Hage, J. A. Pfitzner, H. Martin, H. D. Weil, J. von Bertouch, C. Wainwright, F. H. Walter, W. H. Marshall (Hon. Sec.), and two visitors.

POULTRY-BREEDING.—Article on poultry in latest *Journal* read, and it was decided to ask Mr. Wyllic to give an address on the subject in Eudunda.

FARMING AND GRAZING.—The Hon. Secretary read a paper to the following effect:—

It cannot be disputed that the agricultural interests in this State have been for some years past at a very low ebb, the most vital reason being the uncertainty and scanty rainfall; low prices have also had their influence. We cannot alter the rainfall or price, but we see on every hand, as a result of improved farming and the use of artificial manures, it is possible to increase the yield to a very appreciable extent. If farmers hope to compete favorably with those of other parts of the world energy and foresight combined with improved methods are necessary. Farming should be carried on in conjunction with sheep. Land should be enclosed and sub-divided by sheep-proof fences, and no more sheep kept than the land will carry. A farmer having 300 acres of land fit for the plough should crop 100 acres only each year, have 100 under fallow, and the remaining one should be grazed. By doing this he would have a rotation each year, and would be assured of a good return; his crop would always be clean, and his land in good heart, and a far larger return resulting than if the 300 acres had been

scratched in every year. Land could be well worked by following directions laid down. Crops should be harvested with reaper and binder, as the grain can be taken off earlier than with the stripper, and a better sample of wheat obtained; also avoiding in many instances danger of fire and loss of grain occasioned by high winds that prevail during harvest time when wheat is dead ripe. The straw from wheat cut in this manner is also good feed for stock. A silo pit should be part of the equipment of every farm, ensilage being a good summer fodder for cows and pigs. Every farmer should conserve as much water as possible; he should study only to keep the best stock, horses, cows, pigs, and poultry, as the cost to keep good stock in each section costs no more than to keep mongrel breeds, whereas the returns are so much more. Every farm should have its garden plot wherein to grow vegetables, fruit, &c., and this might be placed under the care of the young folk of the home. A flower garden where hardy flowering plants grow will give a pleasing, home-like, comfortable appearance to the homestead. To make farming pay the farmer must take a lively interest in his work, as well as a pride in it, and, helping nature to help herself, his farm home and life will be both pleasant and profitable.

Wilson, June 29.

Present—Messrs. W. H. Neal (chair), H. Ward, J. Nelson, J. Coombes, A. Crossman, H. Need, and A. Canning (Hon. Sec.).

OFFICERS.—Officers were thanked for past services. Mr. W. H. Neal elected Chairman; Mr. H. Ward, Vice-chairman; and Mr. A. Canning re-elected Hon. Secretary.

SHEEP ON FARMS.—Members are satisfied of the value of sheep on farms, but in so dry a district as this it is difficult to see how sheep can be usually kept without starving the other stock. Some members thought it might pay to buy a few sheep to clean the fallows where anything will grow, and then sell them when their work is done, even if they sell for less money than was given for them.

FALLOW.—Decided that early fallowing is best, and, unless rain causes growth of numerous weeds, it is better not to work the land too much, else the results will not be so good as under moderate working. Early fallow, worked about September, is considered best, and if no rain falls no further working should be done before seeding.

TREES AND CLIMATE.—The Hon. Secretary read a paper on “The Effects of Tree-growing on the Climate,” as follows:—

This is intended to be more as a jotting down of a few ideas of my own, and little things I have noticed in my own experience. It is not intended in any way to be scientific or conclusive, as I have not the necessary time nor opportunities for sufficient research to make it either the one or the other.

That trees and vegetation do affect climate is pretty well known from well-observed instances in many and various countries, and the following quotation from a paper of Mr. Tepper's, F.L.S., &c., on the same subject is only typical:—

The first is a quotation from Malte Bruns Universal Geography, I. 470, dating from 1826. The second is one from the principal French journal of forestry, and refers to the year 1876.

“About 1826.

“The present provinces of Tartary remain to be described, being generally known under the name of Great Bucharía. . . . The most noted of all the provinces is that of Soyd, so named from the river that flows through it. ‘For eight days,’ says Ibn Hunkoh, ‘we may travel in the country of Soyd, and not be out of one delicious garden. On every side villages, rich cornfields, fruitful orchards, country houses, gardens, meadows, interspersed by rivulets, reservoirs, and canals, present a most lively picture of industry and happiness. The rich valley of Soyd produces so great an abundance of grapes, melons, pears, and apples that they are exported to Persia, and even to Hindustan. I have often been at Kohandis, the ancient capital of Bucharía. I have (often been) cast my eyes all round, and never have I seen a verdure more fresh, or abundant, or of wider extent.’

“About 1876.

“The Khanate Bucharía presents a striking example of the consequences brought upon a country by clearings. Within a period of thirty years this was one of the most fertile regions of Central Asia, a country which, when well watered, was a terrestrial paradise; but within the last twenty-five years a mania of clearing has seized the inhabitants, and all the great

forest has been cut away, and the little that remained was ravaged by fire during the civil war. The consequence was not long in following, and has transformed this country into a kind of arid desert. The watercourses have dried up, and the irrigating canals empty. The moving sands of the desert, being no longer restrained by barriers of forest, are every day gaining upon the land, and will finish by transforming it into a desert as desolate as the solitudes that separate it from Khiva."

We have perhaps not been in possession of the country long enough to say with certainty that the destruction of practically all the natural vegetation of the country has adversely affected the rainfall; but this much is certain, the average rainfall of, say the last thirty years, is lower than the previously recorded average, and the closer we come to the present time the more marked is the difference in the averages.

The most singular, but yet the most noticeable feature of our rainfall is the fact that the rain so often keeps away to the south of us, and passes us altogether; it is literally pushed off the land by a large area of high pressure in the interior, and goes away to the south and east of us. Now the chief difference in the country of the interior covered by this area of high pressure is its almost complete absence of forest or scrub, and to a large extent its general barrenness. If then, this is the only general difference, it seems not unfair to draw the inference that this is the cause of the high pressure which pushes the rain to the south of us. Someone may say—"Can absence of vegetation cause this pressure." It is certain that the high pressure is there, and that the area of generally highest pressure is the most treeless.

I dare say many have noticed how cool the leaves of trees and plants keep on even the hottest days. I have often wondered that the intense heat has not scorched and withered them up; and so it does as soon as the roots cannot obtain moisture, as I have amply experienced in trying to coax my sugar gums to hold out through the long continued drought. Then it seems clear that the moisture obtained by the roots has some connection with the coolness of the leaves in hot weather. I imagine it must be something of the same principle which keeps the water in our waterbags cool, that is, evaporation. Most of you know even more about the waterbag than I do, and you know that a waterbag hung in a draught cools quickest and best; the one evaporating quicker than the other, cools quicker. Now I think that water or moisture must be gathered by the roots and sent to the leaves, where it evaporates in a similar manner to that in the waterbag, and thus cools the leaves. Now where there are large numbers of leaves being cooled in this way it is only natural to suppose that the air around the leaves will be cooled and kept at a more even temperature, and where the trees are many and cover large areas, the air between the trees is cooled and in this way a very large body of air is cooled down, and must of necessity affect in some way or other the air outside the tree covered area, or the air passing over or through the area affected by the trees; and if this is so, we should have less of the extremes of heat and cold, even if we got no more rain; but I think the general observation is that the countries with the most equable temperature have good rainfalls.

Perhaps some will say that if vegetation will tend to make the surrounding air cooler and cooler it will thus engender intense cold; but I think not, as the leaves will not cool the air very rapidly when it reaches a moderately low temperature.

Now I think that if we had a wide belt of forest to the north of us it would undoubtedly act as a breakwind, and we might then have less of terribly hot blighting winds, which so often spoil our prospects in the spring season.

Some will very likely point out that much of our land was never forest land as we understand the term "forest"; but it was covered with scrub and bush, all of which grew an innumerable quantity of leaves, which are the chief means of cooling the air, and to a certain limited extent providing the air with moisture, which is drawn from the store of moisture in the ground; and to that extent they must have beneficially affected the atmosphere, and of course their absence affects the air injuriously.

Members are desirous that consideration should be given to the above subject, and thought that it should be discussed at the next Congress in Adelaide.

Koolunga, June 27.

Present—Messrs. T. B. Butcher (chair), J. Button, F. J. Shipway, R. Lawry, G. Cooper, J. Butterfield, Geo. Jose, T. Freeman, R. H. Buchanan, and J. C. Noack (Hon. Sec.).

SHEEP ON FARMS.—Mr. Shipway initiated a discussion on the question will sheep pay on farms. He showed that his experience had been profitable. He strongly emphasised the dangers of overstocking. To be profitable, sheep must be well cared for and well kept. For cleaning and

manuring the land sheep were invaluable. Members generally agreed with Mr. Shipway, some going as far as to say that leaving the returns from the wool out altogether sheep were profitable on the farm.

MANURE EXPERIMENTS.—Mr. Buchanan initiated discussion on this subject. While he did not think land in this locality required so much manure as in the older cultivated land, such as near Roseworthy, it would be well to experiment with varying quantities so that the most profitable quantity can be ascertained. He did not believe that the blighting effects of hot winds were increased by the use of manures. Considerable discussion ensued, it being generally agreed that it was advisable to continue experiments in connection with the use of manures.

Port Germein, June 29.

Present—Messrs. P. Hillam (chair), W. Crittenden, J. K. Deer, C. O'Loughlin, W. Holman, D. Thomson, J. R. Gluyas, A. Thomson, F. G. Blessing, A. H. Thomas (Hon. Sec.), and two visitors.

FEEDING HORSES.—Mr. Deer considered it necessary to give horses that were expected to perform hard work oats with their other food; crushed corn was too heating. He believed in feeding long hay whenever practicable, as the horses derive more good from it than from chaff, which they often swallow without first masticating it properly. Members generally agreed with Mr. Deer.

IMPROVEMENT OF HORSES.—Members were of opinion that to improve the horse stock, and especially the draughts, breeders would have to breed from only first-class stock and do away with second-rate animals. They were also of opinion that it would pay to breed good animals, as they would always realise good prices. Mr. Blessing considered that sufficient attention was not given to the breeding of horses. Too often anything that would get a foal was used because it was cheap. He thought they had some of the worst horse stock in Australasia. Mr. Crittenden disagreed; he had been through various districts in the other States, and was of opinion that as regards roadster stock we were ahead of the other States, but were behind in draught stock, owing to the practice of breeding from second-class animals.

Mundoorra, June 28.

Present—Messrs. R. Harris (chair), T. Watt, W. Aitchison, W. Mitchell, W. J. Shearer, W. D. Tonkin, J. J. Vanstone, D. Owens, F. Haines, C. Button, and A. E. Gardiner (Hon. Sec.).

SHEEP ON FARMS.—The Chairman has kept sheep for nine years, and is satisfied that no one having 1,000 acres of land of fair average quality should be without a few sheep. He has been able to dispense with one-third the usual number of working horses, has had a fair return from his sheep, and has grown better crops of wheat. They ate up all the cockspur thistle which had been troublesome before. Farmers must guard against overstocking. It is a good plan to reserve one good paddock of feed for the winter months. When the rain sets in there is young grass with the old feed, and the sheep do not scour. Mr. Mitchell has kept sheep for six years, and is well satisfied. They keep down weeds on the fallows, but in seasons like the last they cause much anxiety on account of scarcity of feed. All members are agreed that sheep are valuable in destroying weeds on fallows.

FALLOWING.—All members agree that early fallow is right, and work them

down as fine as possible. Mr. Button finds that late fallow on sandy land prevents it drifting, as it turns up lumpy.

PICKLING SEED WHEAT.—Members ridiculed the idea of wasting time and labor in subjecting wheat to hot water treatment for prevention of bunt, when the work can be so easily and well done by the aid of a small quantity of blue-stone dissolved in water.

Millicent, July 4.

Present—Messrs. H. F. Holzgrefe (chair), S. J. Stuckey, H. A. Stewart, W. R. Foster, H. Hart, H. Oberlander, R. Campbell, H. Warland, A. McRostie, J. Davidson, and E. J. Harris (Hon. Sec.).

RAINFALL.—For June, Millicent, 5.43in. ; Mount McIntyre, 7.64in.

ARBOR DAY.—The Hon. Secretary said that, of hundreds of trees planted on Arbor Day, comparatively few had lived. A member remarked that he had seen a goat grazing in the enclosure where the trees were planted by the school children last year. From practical results, members conclude that trees planted during April succeed better than those planted during July and August. It was resolved to recommend the Conservator of Forest to distribute trees in the South-East for early autumn planting. Trees planted in April this year were doing better than others planted from the same bed in August last year. Mr. Hart said he had found it much more advantageous to raise his own trees instead of getting them from the nursery. Mr. J. Davidson said it was found to be the best way in New Zealand to transplant pines twice or thrice before planting them out permanently. Mr. Stuckey said if anyone merely wanted a windbreak, the best way was to plough up a strip of land and sow a mixed lot of forest tree seeds broadcast.

SEEDS.—Mr. A. Stewart distributed seeds of White Apple cucumber, and tabled specimens of Luffa.

OFFICERS.—The Chairman and Hon. Secretary were thanked and re-elected.

Gladstone, July 6.

Present—Messrs. W. A. Wornum (chair), J. Gallach, C. Gallach, J. Rundle, W. Brayley, G. M. Growden, J. Shepherd, J. Sargent, J. R. Smallacombe, J. Milne, C. Goode (Hon. Sec.), and one visitor.

HOME GARDENING.—Mr. J. Gallash read a paper on “Does it Pay to Grow Vegetables for Home Use?” to the following effect:—

This is a matter worthy of careful consideration. Many people say it does not pay a farmer to grow his own vegetables; but his opinion was that it does pay, although in many cases he cannot grow a supply for longer than about six months each year. Some farmers have no garden at all, and others who have gardens give them no attention beyond simply putting in a few seeds or plants and leave them to do the best for themselves. Under such conditions there is failure and the garden does not pay, and the “gardener” is much discouraged; but “anything that is worth doing is worth doing well,” and the land that is to be used for gardening purposes should be heavily manured with well-decayed stable dung, dug in or ploughed in as early as possible, and then levelled and dug over well before the seeds or plants are put in, so as to mix up the soil and manure. Where there is enough land it would be well to have several plots and manure one each year, so that the plot that was manured last year should be well worked again and planted this year. If the seeds or plants are put in too thickly the result will be most unsatisfactory, as everything will grow rank and spindled. If enough seeds to sow half an acre are sown upon a few yards square, the result will be eminently unsatisfactory, and none of the plants can reach full development. Where it is found that the seedlings are coming up too thickly they must be thinned out, so as to allow the remainder room enough to mature to their full size. Seedling cabbages in the nursery beds should be thinned to 2in. apart, and when planted out they should stand 18in. apart in the rows, and 2ft. between the rows; carrots should stand not less than 3in. apart in the drills,

with drills 15in. apart; turnips should stand 8in. apart. The best way to thin turnips is with a 6in. hoe and cut out everything closer than 8in. Weeds must be cut out later on with a smaller hoe. Even where there are no weeds the hoe must be kept going to keep the surface loosened up, and so retain moisture and aerate the soil. Every farmer can easily devote half-an-hour now and again to the cultivation of his vegetable garden, and that is all that is needed, because he does not need to grow large quantities of any sorts of vegetable. To maintain supplies small pinches of seeds should be put in at intervals, so that plants may be coming on whilst the others are getting fit for use. Half an hour after dinner, whilst the horses are feeding, can be devoted to the exercise of weeding and hoeing in the garden. When rain sets in early the seeds should be sown early; but it is necessary to watch the seasons. If there is no rain, or very late rain, it would be necessary to apply water by hand in many cases, and then perhaps it would not pay, as the plants cannot usually do well when the season is against them. With early rains sow early-maturing cabbages and cauliflowers and a few turnips as principal crops, and if the season continues to be favorable sow anything else that may be liked. If farmers wish to avoid doctors' bills, and to keep strong and healthy, they must grow vegetables; for if they have to be purchased they are not used as freely as they should be, and often are not as good and as fresh as they should be.

Members complained that they had difficulty in obtaining reliable seeds, and recommended growers, where possible, to save seeds of their own raising. Mr. J. Shepherd said he obtained his carrot seed by purchasing exceptionally fine carrots and planting them for seed-bearing. Mr. C. Gallasch said he had tried manuring with super. and with a mixture of basic slag and super., and got the best results from the mixture. The Chairman said he had found bone super. beneficial to turnips.

PROFESSOR LOWRIE—A resolution expressing appreciation of Professor Lowrie's services and regret at his removal from the State was unanimously carried.

Willunga, July 6.

Present—Messrs. W. J. Blacker, M.P. (chair), J. Valentine, T. Pengilly, A. Slade, J. McMurtrie, J. Binney, and J. Allen.

IMPROVEMENT OF HORSES.—Considerable discussion took place on the scheme drafted by the special committee of the Royal Agricultural Society of Victoria for the improvement of horse stock, Government encouragement and assistance being a main feature. Most present agreed on the point as to registration of stallions, but could not agree with the proposals in reference to the registration of mares. Members were unanimous that the Government should encourage the improvement of the breed of both draught roadster horses by offering liberal prizes under certain conditions for first-class stock. It was decided that, as the matter was of the utmost importance to South Australia, further time should be devoted to its consideration.

Bowhill, July 6.

Present—Messrs. N. P. Norman (chair), E. P. Weyland, J. McGlashan, F. H. Baker, J. Waters, A. Dohnt, jun., and F. A. Groth (Hon. Sec.).

MANURING.—Members consider that from 60lbs. to 70lbs. of English super. is sufficient for an acre in this locality.

TREATMENT OF HORSES.—Mr. A. Dohnt read a paper to the following effect:—

Sore shoulders is one great trouble with some farmers' horses. Every one should breed with a view to get good-shaped shoulders for working purposes, and not too fine skinned, as these are more liable to have sore shoulders. After a period of idleness horses should at first be worked for short spells to harden the skin and prevent scalding. After working them, especially at first, it is a good plan to remove the collar and wash the shoulders with clean cold water. The animals should be well cleaned—more particularly the shoulders—before putting on the collar, which also should have been well brushed and cleaned. Each horse

should have its own particular and well-fitting collar. Neglect of this will put the collars out of shape and cause sore shoulders. Horses should be broken to light work when two years old. When worked they get feed, which is not always the case when left unbroken in the paddock where there is but little to eat, and they get sanded, which throws them back a lot.

IMPACTION.—Mr. W. Towill forwarded a paper, which was read by the Hon. Secretary, to the following effect:—

Large numbers of cows have lately died from impaction of the omasum, or “bibles,” in this locality. This disease can be prevented, or, if acquired, can be cured. Impaction is a result of eating dry herbage, which causes acute indigestion. Change of food and a little medicine is required to correct this. He advised to give the animal affected ten drops veterinary nux vomica in a wineglassful of water twice a day for two or three days, and a feed of chaff and bran with a little bonemeal once a day. All chaff heaps should be enclosed to prevent cattle getting at them and grubbing down to the bottom in search of grain, with which they pick up a lot of dirt, causing indigestion. Chaff should be fed out in bins, boxes, troughs, or otherwise. In case a cow has become impacted, the symptoms are apparent some time before it assumes the acute stage. They look dull and mopish, and drag behind the others, even when they are in good condition; they begin to get stiff, and dribble at the mouth. Then they do not care to stand up for long, and soon lie down again. If taken in time the disease is easily cured. Give a bottle of raw linseed oil, or berg oil if they are very bad; boil some linseed and give them three bottlefuls every day, drenching them with it. Boil some oats, mix with bran, and give it to the animal in moderation. It will be found that the animal will breathe very rapidly, and the breath will be offensive. If troubled with gas in the stomach, give a tablespoonful of carbonate of soda as a drench; or, if very bad, drench with the boiled linseed for a week; after that give them nux vomica and aconite alternately four times a day, in ten drop doses, to correct the digestive system and reduce the fever. He had cured a heifer heavy in calf by the above system, but lost a cow through following only the first part. She died from tympanitis, or gas, and ought to have also been treated with the nux and arnica.

Mylor, June 30.

Present—Messrs. W. J. Narroway (chair), Wm. Nicholls, J. Nicholls, W. H. Hughes, E. Hayley, E. J. Oinn, T. J. Mundy, C. Nielsen, W. G. Clough (Hon. Sec.), and five visitors.

“**POULTRY.**”—Mr. C. Nielsen read a paper on this subject. He had found that it pays best to keep the good-laying strains of poultry, even if they are not so large in body as some other breeds. The white Leghorn and Minorcas were good breeds, and useful for the table, the flesh being good and not coarse. Chickens should be hatched about July for laying the following winter, when eggs fetch the best prices. Chicks need careful attention in feeding and housing. It pays well to keep fowls if their food is grown on the block, and if proper shelter and food and attention is provided. In the discussion that followed on the best food for fowls the general opinion was expressed that wheat, peas, roots, and Kaffir corn grow well in this district; and Mr. C. Nicholls stated that 15bush. to 20bush. of wheat per acre can be grown here.

Appila-Yarrowie, June 28.

Present—Messrs. P. Lawson (chair), J. C. W. Keller, C. W. H. Hirsch, A. Fox, J. Wilsdon, N. Hannagan, W. Stacey, J. Daly, J. H. Klemm, E. Catford, W. C. Francis, R. H. Grant, G. A. A. Becker, and C. G. F. Bauer (Hon. Sec.).

NORTHERN BRANCHES CONFERENCE.—This Branch is in favor of holding the Annual Conference of Northern Branches of the Agricultural Bureau at Gladstone as usual, for the reason that Gladstone is most central and convenient.

SHEEP ON FARMS.—There are very few farms in this locality where sheep are not kept. Mr. A. Fox has found that it pays very well to feed his sheep. He mixes two bags of chaffed hay with one bag of wheat chaff. When hay is worth £2 per ton it will pay well to feed ewes with lambs on hay chaff.

MANURES.—Some members have used 40lbs. super. per acre on plots and 100lbs. per acre on others, but could see no difference in the crops. Some members had their wheat blighted, and do not attribute it to the manure but to the stage at which the crop had arrived when the hot winds came on. One member reaped seven bags per acre off a paddock that had been fallowed for two years.

Mount Remarkable, June 27.

Present—Messrs. C. E. Jorgensen (chair), A. S. Marshall, H. N. Grant, J. B. Morrell, T. Yates, H. Humphris, G. Yates, T. H. Casley, J. McIntosh, and J. D. O'Connell (Hon. Sec.).

CROWS.—The Chairman said poisoned meat will not always kill crows, but by poisoning an egg with strychnine they soon die. Mr. Casley said he believed the crows which were dying at his place had been eating of the poisoned carcasses of sheep on the adjacent sheep run. Mr. Jorgensen believed that the crows died from eating rabbits poisoned with phosphorus. Farmers should do their best to get rid of crows, as they do little good and a lot of harm. [Crows eat no end of mice, locusts, grubs, &c., and if they were all killed the farmers and graziers would be driven off the country by various pests.—GEN. SEC.]

ODDS AND ENDS ON A FARM.—The Hon. Secretary read a paper to the following effect:—

Although there are very many who fancy that it is easy to run a farm, it is highly probable that a majority of those who have had no previous training to the occupation would make a signal failure were they to undertake farming. It requires a lot of skill and experience to properly work a farm. The first thing met on visiting a farm is the fence, and one can judge how the farm is managed by the quality of the fences. If they are substantial and well kept it is probable that the rest of the farm is equally well arranged. Bad fences are a nuisance to the owner and a curse to the neighbors. It is pitiful to see a crop enclosed with one barb wire on posts set at wide intervals, and it may well be surmised that the tillage has been on a par with the fencing. The next prominent feature will be the stables, sheds, and outhouses. It would be unwise in the North to keep horses in closed stables, but they certainly require shelter. A stone stable with thatched roof, open to the east, is probably the best. Slabs will do as well as stone, and galvanized iron will do for the roof. This has its advantage, as being less liable to fire; but is not as cool as straw in summer, or as warm in winter. There is nothing so injurious to a horse's health as a close, stuffy, badly-ventilated stable, and the open front will obviate this. Drainage of the stable and yard is absolutely essential to the health and comfort of the horse, and he should be rubbed down once or twice a day when working to make him look better, feel better, and work better. On some farms the horses are regularly cleaned night and morning, and they are able to work hard all the year round; they look better on even less feed than those on other farms that are not groomed, and they generally take first prize at the local shows.

There is more sin amongst our farmers in respect to care of implements than in anything else. When we find a £60 binder used to stop a gap in the fence in one place, a drill in another, and see the horses whilst mowing tumbling into the harrows that were left on the hayfield where the farmer finished putting in the seed, we may conclude that the owner was not cut out to be a farmer. All implements should be housed as soon as done with; all iron-work coated with paint, oil or grease once a year, and all wood should be painted every second year. Every shilling spent in this way may save a pound in the long run.

How often we notice that harness is ill attended to. If leather is regularly cleaned and oiled or groused it wears very little, and harness well looked after in this way is far more pleasant for the horses. A first-class team yoked up with a mixture of green hide, leather, copper rivets, No. 8 wire, and a little binder twine never can look well, nor can it look nice in a set of harness that is hard, dry, and dirty. To remedy this latter fault soak the harness in water as hot as the hand can bear, and use plenty of common soap; remove it and then rub in plenty of neatsfoot oil. When thoroughly dry give a coat of blacking made of mutton suet and lampblack.

Although fencing, stables, sheds, and outhouses are of most importance in considering improvements on a farm, there is no reason why the farmer should not have a comfortable home for himself, and in connection therewith should always be a kitchen garden and some flowers, and, where rainfall will permit, a few fruit trees also. There are many half hours

and even half days in the year which could easily be devoted to the garden. The menfolk should take the main part in this work, and not leave it to the women and children. There are many farmers who do not know one flower from another, and can scarcely name the ordinary vegetables. How can people be happy unless they are taught to take an interest in the works of nature? Yet there are a great many farms in the North with not a sign of a tree or a garden of any sort—a dreary desert. It is no wonder that young people want to get away from such dreary places and make their home in town, where life is more pleasant.

Farmers, as a general rule (with some exceptions), keep too many horses, and many of them of a very poor stamp. It takes less food to keep a good working horse than a mongrel that works hardest in the stable. In most cases the best working horse is the easiest to keep, and the same remark applies to cattle and sheep. A good dairy cow costs far less to keep than the badly-shaped useless class often seen on farms. There are some really good common cows, and these crossed with pure-bred bulls of a dairy family would give rise to improved dairy herds. So long as the abominable mongrel bulls are allowed to roam at large it will, however, be quite impossible to improve the dairy herds. The first cross between a Jersey bull and a Shorthorn cow gives the best all-round cow. The best paying stock on the farm are the fowls if they are well selected and mated, properly fed and housed, and well looked after. Not fancy fowls, but general utility birds. The best lot he ever knew were crosses from Langshan hens by Minorca roosters. Only one rooster was kept, and was always shut up, except at the proper time: he was mated with six or seven Langshan hens, from the eggs of which the flock was kept replenished. The cockerels soon reach a great size, and realise 6s. or 7s. a pair at Broken Hill. People who raise bunches of feathers and a few bones, which realise only 8d. to 1s. each, say “poultry-breeding” does not pay; but the same feed with a little selection and management, would have raised a meaty fowl worth 3s. 6d.

There is more ingenuity, cleverness, zeal, and common sense needed in working and managing a farm profitably than there is in any profession or occupation in this State; and when everyone recognises this fact, and carries the rule into effect, the farmers' occupation will be successful in nearly all cases.

Mallala, July 8.

Present—Messrs. H. B. Moody (chair), G. Marshman, W. Temby, S. Temby, F. M. Worden, J. McCabe, T. Nevin, J. Churches, W. R. Stephenson (Hon. Sec.), E. M. Sage, of Balaklava Branch, and four visitors.

DISEASE IN SHEEP.—Mr. C. J. Valentine had informed Mr. H. B. Moody that his sheep were suffering from ovine ophthalmia, accompanied with unusual fever. He had recommended bleeding, and use of zinc lotion after washing the eyes of the sheep. The treatment was beneficial, and the sheep were improving.

FRUIT CULTURE.—Mr. E. M. Sage, of Pinery, read the following paper:—

I think I need say very little about the planting of fruit trees. There are one or two things, however, that it might be as well to mention. First, do not dig deep holes, as that is labor thrown away. Plough as deeply as possible without bringing the subsoil to the surface, and then sink holes just deep enough to plant the tree the proper depth. If deep holes are sunk, unless the soil is tramped in again as tight as before, the tree and soil will sink, so that the butt of the tree is lower than the roots at the edge of the hole, which should not be; and, besides, in a firm clay the hole will act as a tank, and the water from all round will drain into it. The apricot, at any rate, will stand but very little stagnant water at its base. Then do not plant in soil that bakes two or three days after rain. A sandy soil with good clay at a depth of 1ft. to 2ft. is best, but if there is limestone rubble overlying the clay it will not harm—stone fruits, in fact, like limestone. It is not so well for the pip fruits to have much limestone, although the bulk of my land has a fair amount of rubble right through it, and apples and quinces do fairly well there. When planted, keep the land worked as well as possible; cultivate deeply at the beginning of the season, and gradually get shallower as the summer comes on.

Of apricots, Newcastle Early, Oullin's Early, and a kind called Pale or Late Superb do better than Moorpark, except on the sandiest soil. Where there is limestone the Moorpark bears very irregularly; it blooms badly, the buds dropping off instead of opening. The Newcastle Early is a small fruit, but the stone is small in proportion; they bear heavily and regularly, and the tree is a very strong grower. In the wetter districts the Oullin's Early is inclined to be sour and watery, but the dry climate seems to just suit it. I have tried several others, but the three just mentioned are my best.

The dark plums do better than the light. The light plums are very apt to scald just when

ripening if we happen to get a heat wave, and the trees do not seem so hardy. Early Orleans, Prince Englebert, Blue Gage, and Diamond do well.

Peaches and nectarines are the fruits that nearly every one likes to grow. There is a great deal of difference in the habit of the various kinds of peaches and nectarines; some will carry the fruit close down to the old wood, others right out on the ends of the branches. The kinds for a dry district are those that carry the fruit buds closest to the old wood, because in the first place the fruit is better sheltered and is not blown about by the wind, and a smaller tree will carry the same quantity of fruit and be less in the way when cultivating, and easier reached for pruning and fruit-picking. Early Rivers, Early Silver, Early Crawford, Lady Palmerston, and Salway are about the best with me. Clingstones are not suited to a dry climate, as they become too hard. I have several of the red-checked old varieties, but they do not do so well as the white or yellow fleshed Brigg's Red May does well, but does not bear so well as Early Rivers, and there is only a week difference in them. Peaches do not do well with me where the sand is deep, and I prefer the peach worked on the hardshell almond stock to peach worked on peach. I find, where I have both side by side, that the peach on almond will always have the best crop, and the only place where I am troubled with aphid is where I have the peach on peach. I have it there every year, and sometimes on the peach on almond alongside; but in a patch of about eighty trees—peaches and nectarines—all on almond, I have never seen aphid yet, and the trees are eleven years old. As I have no difficulty in selling the fruit at a very fair price, the quality of the fruit must be good.

Pruning. The apricot bears its fruit on spurs thrown out on previous year's wood, and the object of pruning is to shape the tree as well as possible, and only leave as much wood as will fill up with fruit spurs the next season. Until a tree gets ten years old I do not think there is any necessity to interfere with the fruit-bearing wood; after that it is advisable to shorten back and perhaps thin out the fruit spurs on the lower part of the tree, and every year go a little further up. A good deal of judgment is needed, as, if pruned too long, the wood is not all filled up with spurs, and the tree is higher than it needs to be; if pruned too short it only grows stronger, and part of the work is wasted. You need to look at the previous season's pruning as a guide as well as the vigor of the growth you are working on. I do not think that, after pruning the plum for several seasons to shape and stiffen the tree, there is anything to be gained by very much pruning, as a good length of plum limb seems to fill up with spurs. Overcrowding or crossing of limbs must be avoided. After the trees have borne several crops, shortening back and thinning of spurs may be resorted to to induce new wood, because any tree will bear the best fruit when it is fairly vigorous and the sap has less old knotty wood to flow through. The peach bears its fruit on the previous season's wood, and peach wood bears fruit but once. As I have said before, the best kinds to plant are those carrying fruit buds close down to the previous year's wood. Pruning peaches is very different to pruning apricots or plums, as every twig has to be examined and pruned so as to leave what is considered sufficient fruit buds to ensure a crop. Some kinds carry their fruit buds right out on the ends of the growth, and, if pruned, all the crop is cut off; and if left alone the tree gets all over the place, or, in our dry districts, ceases to make anything but spindly barren shoots, and what little fruit it does carry is banged about by the wind.

If the kinds I mentioned at the beginning of this paper are planted and carefully pruned so as not to leave too much wood, but enough to carry a fair crop and at the same time to enable the tree to grow fresh fruit wood for the next season, a fairly regular crop of good peaches or nectarines can be grown in any district with a 15in. rainfall.

Apples, pears, and quinces should only be planted where the floodwaters can be turned in in the winter time, or at the foot of some of our sandhills, where there is always more or less soakage. I do not think irrigation can be carried on many years with the bulk of our well waters, as the soil seems to contain quite as much mineral in its natural state as is good, without increasing the quantity with the more or less mineral-charged well waters.

If it is thought advisable to plant breakwinds, they are needed here most on the seaward side, and should not be within 60ft. of the trees. I do not believe a great deal in windbreaks, as the more sheltered a garden is the more diseases there will be, such as curl-leaf, aphid, scab, &c., which counteract the good of the breakwind. The best way is to plant apricots to the seaward side, as they are not affected by the west winds the same as peaches, etc.; in fact, the tops of the growths on apricot trees always turn to the west, and the further you get from the sea the more marked the habit becomes. If at this time of the year, when the trees are bare and you can get a look through, you stand some distance to one side of a good-sized apricot tree you will notice the tops of the growths all turn to the west or south-west. Mr. Sage gave several examples of pruning from branches he had brought with him, and received a hearty vote of thanks.

MEDEA WHEAT.—Members were thankful for the information in the last number of the *Journal*, but they would like to know how it is that Medea wheat is bunt-resistant also. [Because the "stocking" covers the shaft or stem, and because the shaft is rather flinty.—GEN. SEC.]

Kapunda, July 6.

Present—Messrs. W. Flavel, J. P. (chair), W. M. Shannon, Peter Kerin, Pat. Kerin, J. H. Pascoe, J. O'Dea, T. Scott, B. R. Banyer, G. Teagle, J. J. O'Sullivan, G. Harris (Hon. Sec.), and one visitor.

"CHEMISTRY APPLIED TO AGRICULTURE."—This meeting was holden at the School of Mines, when Mr. B. R. Banyer, after quoting the following from Johnson's "Elements of Agriculture"—"the scientific principles upon which the art of cultivation depends are not sufficiently understood or appreciated even by the most practical of men engaged in agricultural pursuits"—said:—

The proposition is scarcely less apt in its application to the Australian farmer to-day than it was fifty years ago, when it accurately described the state of agricultural affairs. The exhausted condition of the agricultural lands of Europe was the cause of attention, particularly by Liebig, being given to the composition of the soil and closer studies in plant life. Liebig's researches bore out his theories that the soil supplied to the plant the bulk of its mineral constituents, and that the elements must be returned to the soil either by artificial methods or by a system of resting or cropping that permitted natural refertilisation. His conclusions were that the soil contained only a limited amount of iron, calcium, phosphoric acid, and other elements, and that when this was used up the soil became barren. He showed, too, how manure acted to restore the deficient ingredients, and how, when land was fallowed, atmospheric influences decomposed the insoluble minerals and supplied the soil with what had been removed by the crops. He advocated the rotation of crops, on the grounds that the different plants removed from the soil substances of plant food in different proportions and of different kinds, and by that means the soil was restored. If agriculture had not progressed in the same ratio in which other industries had during the past half-century, it was not the result of not having had opportunities. It was due to the reluctance of agriculturists to get out of the old grooves and to move on new lines. This reluctance was due mainly to the fact that the effects of the methods of cultivation adopted do not manifest themselves for some years. If the debilitating effects of the colonial system of farming were the sooner apparent and more intense than they are, it would have been an absolute necessity long before now to have followed a more rational system. A succession of unfavorable seasons and low prices for wheat have, however, forced the farmer to partially, at least, abandon notions which have become, metaphorically, hoary with age; he had felt behind him the power of circumstances and modern investigation, whilst disaster loomed ahead, and almost by sheer force he had yielded to modern ideas, and if he had not realised all the benefits he may have expected, he had the satisfaction of having discovered that there is something more helpful to the cultivator than was dreamed of in his philosophy. What had come to the aid of the farmer was chemistry. It had come to him in two forms—on the one hand by the direct analysis of soil and of plant and fruit, and on the other hand by the discovery and manufacture of fertilisers of fixed quantity and quality of composition. Chemistry had been defined as the science which investigated the composition of material substances and the permanent changes of constitution which their mutual action produced, and as a science by which they became acquainted with the intimate and reciprocal action of all bodies in nature upon each other. The proposition was a self-evident one that said "the aim of every practical farmer should be to raise from his land the largest quantity of the best quality of produce at the very lowest possible cost, in the shortest period of time and with the least drain upon the soil." Voorhees in his work on "Fertilisers" says, "The relation of the outgo and income of the fertility elements is an important factor in determining profits, and must be considered. The farmer who secures crops that bring more than they cost, and who, at the same time, maintains or even increases the productive capacity of his soil, is, other things being equal, the broadly successful farmer." There were, however, methods of practice which were entirely irrational and contributed to the real losses of fertility. "Farming," Voorhees continued, "was unprofitable, not altogether because the land was exhausted, but because only those crops are grown which possess a high fertility value, and which have a low market price, and thus the prices received for the constituents in the crop are actually less than they cost in labor and money." Apparently the main aim of the average farmer had been the greatest possible quantity of produce at the least cost of labor and monetary outlay; but the land had been gradually impoverished, and that, with unfavorable climatic conditions, had made the greatest possible quantity of produce raised too small to be profitable at the average market value during recent years. The farmer had not been slow to avail himself of the assistance of labor-saving machinery, but the assistance which chemistry had proffered had either been looked at askance or accepted with much misgiving and fear of result. The comparative slowness with which the aid of chemistry in the form of fertilisers had been received was all the evidence that it was necessary to adduce. Gradually, however, its effects and its necessity had forced themselves upon the agriculturist, and it is admitted that thousands of acres of land that last year yielded heavily would not have given

nearly so good a return were scientific principles not followed of assisting the wheat plant by supplying the nourishment which the soil did not possess in sufficient quantity, or possessed the necessary elements in a form in which they were not assimilative by the plant. But the mechanical supply of a fertiliser as a dressing to the soil was not to be understood as the application of chemistry to agriculture. That was the application of the results of scientific investigation by the chemist, which, of course, was good in its way. There was nothing scientific in distributing broadcast or with a drill a quantity of a substance over the soil, and waiting for the harvest to tell one whether the experiment was going to be a failure or a success. As a rule the farmer did not know from his own knowledge what causes produced the effects he observed, and whether success or failure resulted, he was equally at a loss to account for the result. All he had discovered was that certain results followed certain mechanical treatment of the soil by himself with the aid of implements. Chemistry was the "missing link." It revealed many of the secrets of plant life—what the physical composition of the plant was, the chemical conversion that went on for the development of the plant, the conditions necessary for vigorous and healthy growth, the composition of the fruit of the plant, and the part it takes in the human economy and animal life generally. Having revealed this, it opened the way to the knowledge of the character of the soil from which was produced the more perfect description of plant or fruit. This knowledge led to the further revelation of the conditions which obtained in circumstances under which perfection was reached or not reached, as the case may be. It revealed also the influences of moisture, atmosphere, sunlight, and the processes by which the plant thrived upon these compound elements. The atmosphere was not for the sole benefit of man and animals that breathe with lungs. The plant depended on it for life, it abstracted from it the elements of life, just as man and animals do. The earth was no more a mere foothold for the plant than it was a footstool for man. From it both lived, the former directly and the latter indirectly, but both were equally dependent on it for the sustenance of life. Water was not merely for the bathing of the leaves of plants or softening the soil to enable it to be turned over with plough or spade, but it supplied the plants with the necessary elements of life, hydrogen and oxygen, and dissolved organic and inorganic substances on the surface or in the soil, which were carried down to the roots to be absorbed by them and in time to be converted into vegetable life. Referring to the elements required by plants, Mr. Banyer said one element could not take the place of another. Potash could not take the place of nitrogen, or iron that of phosphoric acid, and the crop-producing power or fertility of the soil was in respect only of the presence of each and all the elements which the life of plants growing upon it required. (Voorhees). With this knowledge the cultivator had a sound basis for his methods of cultivation, and the farmer of the near future, to be a successful man, must possess something of this knowledge. It could not be expected that the average farmer should know anything considerable about practical chemistry. There was, as it were, a gulf between the farmer and the chemist; but the farmer could bridge it to some extent by making himself acquainted with the researches of the chemist. The farmer should know more than he does about the nature and habits of the plant grown, and seek to encourage its perfect maturity by providing, as far as possible, the necessary conditions where they did not exist naturally. Johnson very tersely put the matter when he said—"Armed with the knowledge of such principles, the instructed farmer will go into fields as the physician goes to the bedside of his patients—prepared to understand symptoms and appearances he has never before seen, and to adopt his practice to circumstances which have never before fallen under his observation."

Messrs. O'Dea and Pat Kerin considered it would be well for every farmer to study the items referred to by Mr. Banyer. Mr. Shannon recognised that there was a wide gulf between the agricultural chemist and the practical farmer; but the farmer could profit very much by accepting the teachings of the scientific agricultural chemist, and it was most advantageous to have lectures such as those given at the latest two meetings of the Kapunda Branch. The young farmers of to-day had the aid of agricultural colleges and of competent scientific lecturers, which the pioneer farmers had no opportunities of enjoying. Farmers nowadays must materially alter their method of putting seed into the soil and trusting to nature. They must know something of the requirements of the plant, the constituents of the soil, and how to fit the one to the other. He had found that sheep thrived better on land that had been fertilised. The fattest of his sheep this year were on a block of 200 acres that had been fertilised, although the feed was not so abundant as it was on the unfertilised parts. Several members referred to the fables that had been circulated about the supposed poisonous effects of super. on wheat plants, which ridiculous fables have been refuted again and again. Mr. Banyer said

there was no danger [or possibility—GEN. SEC.] of arsenical or phosphoric acid poisoning through the agency of plants; but granting for argument that phosphoric acid was a poison, he said they did not consume phosphoric acid in a free state, but combined with a base, to form a salt, known as the phosphate. It might just as well be said that there was danger from consumption of nitrogen, oxygen, and other elements, and so there was if they were taken in the proper form and in sufficient quantities. Both nitric and hydrochloric acids, for instance, were irritant poisons, but as salts—potassium nitrate (saltpetre) and sodium chloride (common table salt)—both were not only comparatively harmless, but beneficial and indispensable compounds when properly used.

Murray Bridge, July 10.

Present—Messrs. B. T. E. Jaensch (chair), R. Edwards, W. Wundersitz, G. A. Kutzer, W. Schubert, Hermann Schubert, J. G. Newmann, W. G. Hannaford, and W. Lehmann (Hon. Sec.).

OFFICERS.—Officers for past year were thanked, and Messrs. R. Edwards, W. G. Hannaford, and W. Lehmann were elected Chairman, Vice-Chairman, and Hon. Secretary respectively.

SHEEP ON FARMS.—The Hon. Secretary is the only member who has tried feeding sheep on chaffed hay, and his experience has been too short to allow of any conclusion being arrived at. Members doubt if it will pay when chaff is at £2 10s. per ton, and several doubt whether sheep could be fattened on chaffed hay alone, with no green feed in their paddocks. The Hon. Secretary said, any box standing 9in. to 12in. high, and of any length, if not too narrow, will serve to hold the chaff for feeding the sheep. If too long and narrow, the sheep will upset the boxes, and if they are very long, some divisions must be put in, else the wind will blow the chaff out of the boxes or troughs. For lambs the boxes should not stand above 7in. or 8in. He had found that some of the old ewes would not go near the feeding boxes, nor would their lambs. [The whole idea of feeding sheep with chaffed hay is to tide them over a period when feed in the paddocks is very scarce, as it usually is at lambing time. A small quantity of chaffed hay at such a time will save the ewes, and enable them to save their lambs. Under such circumstances it would probably pay to feed the sheep for a couple of months, even were the chaff worth £5 per ton.—GEN. SEC.]

STALLIONS.—Members agreed that it is necessary to make an effort to improve the breeds of horses. Stallions used for hire should be examined by competent judges, and, if found to be sound and suitable, a certificate should be given to that effect. That would check the breeding of weedy, useless horse-stock. It was suggested (but nothing done in the matter) that one member should introduce a stallion, to be approved, and that all other members should pledge themselves to support him in every way, so as to exclude the use of travelling animals of inferior stamp. Finally it was resolved to request the Central Bureau to endeavor to induce the Hon. Minister of Agriculture to introduce a Bill into Parliament to enforce the licensing of stallions used for hire.

Lipson, June 29.

Present—Messrs. E. Thorpe (chair), H. Brougham, Jas. Brown, H. Brown, Geo. Carr, R. Haldane, E. J. Barraud (Hon. Sec.), and one visitor.

SPARROWS.—A bird much like the sparrow was tabled for identification, but as the sparrows are not numerous in this locality none of the members present could identify it.

FEEDING AND WATERING HORSES.—Mr. H. Brown thought horses should be watered before feeding, while Mr. Jas. Brown would feed the horses first. Other members thought it better to adhere regularly to one plan, whether of watering before or after feeding, as the horses drank better than if fed and watered irregularly.

BREEDING OF HORSES.—The Hon. Secretary read letters from breeders of horses *re* purchase of a good draught stallion for service in the district.

Strathalbyn, July 15.

Present—Messrs. D. Gooch (chair), W. M. Rankine, R. Watt, P. Cockburn, and J. Cheriton (Hon. Sec.).

PEAS.—Mr. G. Sissons sent a sample of peas, cut very early, and thrashed out after being stacked. It was a splendid sample of good seed. In discussion of paper on peas read at previous meeting, Mr. Watt said he practised a better method of harvesting peas. He cut them early, stacked them, then chaffed the whole, and winnowed the peas out of the chaff. Members considered that either plan would be suitable in the hilly districts, but on the plains ensilage would be the better way.

Inkerman, July 2.

Present—Messrs. W. Board (chair), Thos. Forrest, D. Fraser, A. Toza, E. M. Hewett, J. Lemman, W. Fraser, and W. A. Hewett (Hon. Sec.).

"COCKY" CHAFF.—Mr. E. M. Hewett objected to the chaff from the winnower being described as "Cocky" chaff, as it was an undesirable name for such a valuable fodder. Members agreed with Mr. Hewett. [What name can be given that would be generally adopted to describe chaff from the winnower? If we call it "wheat chaff" it will lead to confusion with the chaff made from wheaten hay.—GEN. SEC.]

CHAFF FOR SHEEP.—Mr. Forrest reported his experience in feeding wheaten hay chaff to sheep. He had one lot of 140 sheep, and, as feed in the paddocks was scarce, losses began to occur until he commenced feeding them on chaff. He gave them four bags of chaff a day; within a week they began to improve. He continued feeding them through the lambing, and secured 80 per cent. of lambs against only 30 per cent. from the rest of the flock on better pasture but no chaff. He found the lambs ate the chaff readily, and now there is green feed for them they still come for the chaff. He was convinced all the lambs and many of the sheep have been saved by the use of chaff, and his experience was ample proof that it paid to feed sheep on chaff to tide them over a critical period.

"SUCCESS IN RURAL LIFE."—Mr. E. M. Hewett read a paper on the essentials to successful rural life, in which he dealt with the following points:—Comfortable homes, pleasant employment, good fences, water readily available, rational treatment of the land, good tillage and cultivation, fallows, manures, suitable crops for the soil and climate, their pecuniary value in the market, and for use on the farm; conveniences on the farm, suitable stables, barns, sheds, and outbuildings, proper teams, and sufficient live and dead stock on the farm. Mr. Forrest said life on a farm should be made more attractive than it usually is. He could easily tell the difference between farms held on tenancy or by freehold. Young people leave the farm for the town because the home is not attractive. Regarding fences, they need not stand more than 3ft. high, and the wires should be closer. The old-fashioned high fences were which and.

SAND DRIFT.—Mr. E. M. Hewett stated that a resident was hoping to stop a sand-drift by planting trees behind it. [He should scatter lupin seed on it, sow rye, and lay a few bushes or branches on the sand until the plants grow. If he then keeps the sheep off the sand, the drift will be permanently stopped. —GEN. SEC.].

ANNUAL MEETINGS.—Nine meetings have been holden with average attendance of less than seven members; some of them live twenty to twenty-four miles away from the place of meeting.

OFFICERS.—Thanked. Mr. W. Fraser elected Chairman, and Mr. W. A. Hewett re-elected Hon. Secretary.

Onetree Hill, June 28.

Present—Messrs. J. Hogarth (chair), A. Adams, H. H. Blackham, F. L. Ifould, A. H. Riggs, M. G. Smith, and J. Clucas (Hon. Sec.).

THE AGRICULTURAL BUREAU AND THE AGRICULTURAL COLLEGE.—A discussion to the following effect took place:—

Mr. Riggs, an erstwhile student at the Agricultural College, said large amounts were spent in the city on educational institutions which were not within the reach of residents in the country, the disadvantages to the latter being, however, compensated for in some degree by the institutions in question, whose benefits to the State it was difficult to compute, and to treat which with ungrudging liberality would indicate statesmanly shrewdness and foresight. Of late years there had been abundant evidence of all-round improvement in agriculture, which meant increased prosperity to the State. There were about 1,400 members of the Agricultural Bureau throughout the country, and through these and the *Agricultural Journal* comprehensive up-to-date literature was disseminated for the benefit of the farming community. The Agricultural College had done good work, and those who knew anything of it would not hesitate to say it was a most valuable State institution. The credit for introducing the drill and fertilisers had been variously ascribed. Had the new departure originated here we could have seen some reason for looking round for someone to honor, but there is no doubt that experiments at Roseworthy, the results of which had been inspected by our leading agriculturists, and published in the *Journal*, had brought about so rapid and salutary a reform in our agricultural methods, a reform that, in no insignificant degree, had brought prosperity to the community, and brightened our prospects. Farmers who had attended Professor Lowrie's lectures, which were so popular throughout the State—and made his position anything but a sinecure—and had been induced to put his instructions into practice, had doubled their return of wheat; and it was a matter of widespread regret that the Professor should have found it desirable to sever his connection with an institution which he had made an unqualified success, and from a farming community whose confidence he had won.

Mr. Blackham prefaced his remarks with the pertinent query "Who are the adverse critics?" The Agricultural Bureau included some of the ablest men in the State, and they, with others whose interest it was to closely observe the work done, were unanimous as to its excellence. The fact that the inter-State press frequently published papers read at Bureau meetings, and found it worth while commenting upon reports, was gratifying evidence of the merits of our agricultural enterprise and vitality. The *Melbourne Leader*, one of the best authorities on matters agricultural, had published in full and reviewed a paper by one of our own member, Mr. Flower, and the *Home and Farm* another by Mr. Ifould; and in the *Leader* he had noticed that in three months no fewer than six papers from other branches had been similarly treated; and the observant reader of agricultural literature could not fail to note that the *S. A. Agricultural Journal* is closely scanned outside the State, thereby extending the beneficent influence of our agricultural institutions beyond our own borders. Everything that influenced our producing efforts—exchange of opinions, unrestricted publication of results of experiments, analyses, &c.—was of vital importance, and there was nothing "hole-and-corner" in our system. There should be no need to champion these institutions when it is so plainly evident we cannot afford to do without them; nor should they suffer from want of liberal support; but in a community where political vagaries—social feuds, socialistic insidiousness, party jealousy, and intrigue—press out real exigencies it is little wonder that institutions which have been established under the ægis of the Government, and wisely so, to supply some great public need should be sorely hampered in their usefulness. The Agricultural Bureau placed farmers in touch with each other for mutual benefit. Conservative farmers, who in bygone days were in opposition to the Agricultural College, were now staunch supporters of that institution, and many who at first belittled Professor Lowrie's methods and

theory were now amongst those who most sincerely regretted his leaving us. The Professor was an able, energetic man, who had his heart in the work, and had the entire confidence of the farming community, and if departmental friction had anything to do with his resignation it was a matter that was to be deplored, and pointed to a condition of internal arrangements that needed rectifying. Up-to-date farmers must acquire such knowledge as the college imparted, which dignified as well as improved agriculture, and the college was the medium of planting throughout the State cultured gentlemen capable of undertaking offices of public responsibility, and whose influence for good must be far reaching.

Mr. Ifould said these institutions were doing a great work—promoting progress and assuring prosperity to future times. The Bureau was an organisation which enabled capable, representative men to meet together and to give the world, through the press, the benefit of their deliberations. The all-round improvement in agriculture had materially increased our revenue of late years through the railways alone. Those who knew anything of the matter would readily testify to the good work done at the Agricultural College, and the results at the Roseworthy farm—mostly very inferior soil—spoke volumes for Professor Lowrie. It would be wisdom to treat our agricultural industry with a liberality somewhat commensurate with benefits received, and, as results have proved, the money expended upon the institutions they had been discussing would be no merely speculative outlay.

POISON FROM CHEMICAL FERTILISERS.—The question as to whether feed absorbed any poisonous quality from superficial manure upon which it was grown was brought up. One or two members had been told of cases which seemed to give point to this theory. The Chairman did not think the evidence reliable. He had had experience without cause for suspicion, but had known where the manure had been blamed for sheep dying, whilst in the same locality there was considerable fatality in a flock grazed upon land where manure had not been used. Cases of death on phosphated land were referred to when the sheep had “bolted” their food, and roots and sand had been found in their intestines.

Pyap, July 17.

Present—Messrs. C. Billett (chair), J. Bowes, W. Axon, J. Harrington, Geo. Napier, jun., B. T. H. Cox, E. Robinson, J. Napier, J. F. Bankhead, A. J. Brocklehurst, J. Holt, A. Westbrook, H. G. McGough, and Wm. C. Rogers (Hon. Sec.).

PEACH APHIS.—Mr. Axon complained of peach aphis appearing on his trees. [They are now coming up from the roots, which should at once be laid bare for 9in. around the trunk; then swab them all round with a decoction made by boiling 3ozs. of waste tobacco and 4ozs. of soap in 1gall. of water; then spray the branches with the same liquid. If this work is thoroughly done, no aphides will be left.—GEN. SEC.]

POULTRY DISEASE.—Inflammation of the eyes of poultry is prevalent, with swelling and formation of dense pus. Dressing with Condyl's fluid, or with diluted eucalyptus oil has been found beneficial.

EXHIBITS.—By Mr. Robinson—White Milan turnip, from Central Bureau seed, is early and very suitable. By Mr. Bankhead—Setts of potatoes that had been planted in January and dug in May, but had shrivelled, and produced nothing but small excrescences where the eyes had been.

LEMON-CURING.—Mr. Brocklehurst considered the subject of lemon-curing to be of the greatest importance to growers along the Murray River, and directed especial attention to a paper on lemon-curing that was lately read at Renmark Branch of the Bureau, and published in our *Journal of Agriculture*.

ROLLING OF GROWING CROPS.—Mr. McGough advocated the rolling of crops after seed has been ploughed in while the soil is wet. Where the soil is loose, as is the case in many places in the mallee country, the contact of the soil with the seed is not sufficient to cause germination. Some members consider that harrowing of the growing crop is beneficial. Mr. McGough mentioned a farmer who rolled half a field sown as above, and who obtained 4bush. per acre more from it than from the portion not rolled.

REGENERATION OF GRASS LANDS.—Mr. Bowes read an article from the Melbourne *Leader* which drew attention to the obliteration of the natural grasses and the deterioration of some of the improved grasses that occasionally appear, and suggested that this deterioration might be due to deficiency of some necessary constituent of plant food in the soil through continuous neglect to compensate for what has been removed by live stock. It showed that it is not sufficient to simply return to the soil such manure as may be dropped by the stock in yards and stables and upon the paddocks—as a few dairymen and others do—but that it is necessary to harrow or scarify the surface of the paddocks, to sow seeds of suitable herbs and grasses, and above all to supply a fair amount of super., or bonedust, with a little sulphate of potash and sulphate of ammonia. Mr. F. B. Guthrie, of New South Wales Department of Agriculture, recommends 1cwt. per acre of a manure containing $7\frac{1}{2}$ per cent. nitrogen, $7\frac{1}{2}$ per cent. phosphoric acid, and 9 per cent. potash, costing 8s. 6d. If a good percentage of clover can be grown, and the liquid from the bails, stables, and yards can be saved with the farmyard stuff, it would need only a small quantity of super. and phosphate every autumn to keep the pastures in good heart.

Crystal Brook, June 29.

Present—Messrs. J. C. Symons (chair), E. Dabinett, G. Davidson, P. Pavy, A. Hamlyn, W. J. Venning, F. S. Keen (Hon. Sec.).

COST OF WHEAT-GROWING.—Three estimates of cost of wheat-growing, based on the working of a 640-acre farm in this district, and a return of 12bush. per acre, were submitted. Mr. W. Hamlyn's estimate was:—

Three hundred acres to be cropped each year; total yield, 3,600bush., at 2s. 6d. = £450.

EXPENDITURE.		£	s.	d.
Laborers		112	0	0
Extra labor for haymaking		5	0	0
Hay—40 tons.....		40	0	0
Seed wheat—60 bags		30	0	0
7 tons super.		35	0	0
Interest and depreciation—stock and implements....		36	10	0
“ “ buildings and fencing....		33	10	0
Interest on purchase-money		89	12	0
Total		<u>£381 12 0</u>		

He put the value of the land at £3 10s. per acre and charged 4 per cent. interest. On stock, implements, buildings, and other improvements he allowed 4 per cent. interest, and 5 per cent. for depreciation. The value of the implements required was £218; horses, harness, and wagon, £195; buildings and fences £390. The net income for the farmer was therefore £68 8s. per annum. Mr. A. Hamlyn submitted the following estimate:—

Three hundred acres in crop each year, thirty to be cut for hay to feed the farm horses.

REVENUE		£	s.	d.
3,240bush. at 2s. 6d.		405	0	0
EXPENDITURE.		£	s.	d.
Labor		130	0	0
Rates and taxes		5	0	0
Blacksmith, saddler		12	0	0
$7\frac{1}{2}$ tons manure		37	10	0
Interest on improvements and implements		34	0	0
Depreciation		42	0	0
Rent at 4 per cent.		90	0	0
Total		<u>£350 10 0</u>		

The net profit on the year's work is therefore £54 10s. [In this estimate a six-wire fence is provided for. If only wheat is to be grown surely this is an unnecessary expense. Instead of charging cost of seed wheat to the year's accounts, interest and depreciation, 9 per cent. in all, is charged.—GEN. SEC.]. Mr. Pavy's estimate was:—

Two hundred and seventy acres at 12bush. would return 3,240bush., worth £405, and thirty acres cut for hay would yield 37½ tons, worth £37 10s., or a total revenue of £442 10s.

EXPENDITURE.		£	s.	d.
Rent of farm		90	0	0
Seed—250 bush.		31	10	0
Hay for stock.....		37	10	0
Labor		152	5	0
Cleaning wheat		10	0	0
Blacksmith and saddler.....		7	0	0
Keep of two men at 13s. per week		66	0	0
Total		£394	5	0

Net income, £47 15s.

Members were agreed that at present prices it did not pay to grow wheat. [These estimates afford considerable matter for criticism. It will be seen that all are based on the supposition that wheat alone is to be produced, and that the land not under crop is to produce nothing to meet interest on cost, &c. The views of members of other Branches on these points will be of interest.—GEN. SEC.]

Redhill, July 2.

Present—Messrs. R. T. Nicholls (chair), D. Steele, W. Stone, A. E. Ladyman, F. Wheaton, D. Lithgow, H. Darwin, J. N. Lithgow (Hon. Sec.), and two visitors.

PROFESSOR LOWRIE.—A resolution expressing regret at loss of Professor Lowrie's services was carried.

FERTILISERS.—Mr. Ladyman read a paper on this subject, in which he dealt with the various commercial fertilisers and the necessity for replacing in the soil sufficient plant food to supply the requirements of the crops to be grown.

Naracoorte, July 13.

Present—Messrs. H. Smith (chair), E. C. Bates, Job Wynes, H. Buck, F. Welcome, G. Wardle, J. G. Forster, S. Schinckel, A. Johnstone (Hon. Sec.).

GOVERNMENT DEALING IN FERTILISERS.—Mr. Bates would like this question discussed at Congress, and proposed that a delegate from this Branch move that the Government be asked to store fertilisers and supply them to farmers. His impression was that the fertilisers sold were not always up to the quality represented. It would be interesting to know whether the fertilisers which had given such good results at the Roseworthy College were first analysed by Professor Lowrie to determine whether they were up to the guarantee. He did not wish the Government to have a monopoly of the business, but under Government supervision the farmers would have more chance of getting what they paid for. At present they were at the mercy of the Government analyst. Then the samples taken by the Inspector were obtained in a very crude way. Mr. Summers had told him that he took one sample from one bag, and another sample from another bag and submitted them for analysis. [These statements are not only unfair, but are absolutely incorrect. This matter was brought

forward by Mr. Bates at last year's Congress, and the process of sampling of fertilisers was explained fully. Not only so, but in the October issue of the *Journal*, which is posted regularly to Mr. Bates, Mr. Summers explained the practice adopted to check the quality of the fertilisers sold, so that there is no excuse for such statements.—GEN. SEC.] Mr. Wynes opposed the suggestion, as there was no necessity for the Government to interfere. The merchants were required to sell under a guarantee, and there was an Inspector to see that the fertilisers were of the guaranteed quality. They would be no more safeguarded if Mr. Bates' proposal were carried out, but would probably have to put up with annoying delay in deliveries of their fertilisers. He moved "That the Branch does not favor the Government purchasing and distributing manure." This was carried after some further discussion.

EFFECTS OF FERTILISERS.—Mr. Bates applied 2cwts. super. per acre to rape, but got no more crop than from unmanured land. He also used super. at rate of 1cwt. per acre on grass about three months ago, but could see no benefit yet. Mr. Buck had used super. on lucern, with the result that every leaf was killed. Mr. Bates said 4cwts. to the acre on lucern had not injured it. Mr. Wardle thought this year it had been too cold for anything to grow much, whether manured or not; they would see the benefit later on. Mr. Forster applied 90lbs. of Bally bonedust per acre to wheat on land that usually produced a good crop of oats, but not wheat. The wheat, however, showed the benefit of the manure from the start, and was beating the oats. The application of fertilisers to grass land also had a marked effect. Mr. Smith had been using fertilisers for several years, and always found that there was a distinct difference in the crops. When he first used super. he spread it too far apart, with the result that strips only were benefited. For months after the grass on these strips of land was 6in. or 7in. high, and the stock were always feeding there. Mr. Schinckel said his experience of super. was satisfactory. He applied it about the first week of July to land that never produced more than 4bush. or 5bush. to the acre. Up to the middle of September he could see no result, but when it came to harvest he reaped 20bush. per acre. Mr. Buck mentioned cases where super. had failed to show any result, while in many other instances good returns had been obtained. He thought this difference must be due to varying qualities of manure. [And is it not likely that varying conditions of soil, cultivation, situation, &c., also affected the result.—GEN. SEC.]

THE AGE OF HORSES.—Mr. Forster read a paper at previous meeting on "How to Tell the Age of a Horse," and some discussion took place. In response to requests he agreed to give some practical lessons on occasion of the local show. Instances of horses in this district living to 30 and 35 years were given.

TREE-PLANTING.—Mr. Johnstone read a paper on this subject. Mr. Bates referred to alleged destruction of codlin moth in New Zealand by a parasite. Inquiries were made as to use of sheep dip as a spray. Mr. Johnstone had killed all the leaves and fruit on peach trees by spraying with this material. Mr. Schinckel considered the present method of inspection in regard to codlin moth a farce, as far as it was carried out in this district. It was not fair to inspect a few orchards here and there, and take no action in regard to others.

AGRICULTURAL COLLEGE.—Some discussion took place on the management of the Roseworthy College, the subject of contention being as to the wisdom of attempting to carry on the work at a profit to the sacrifice of experimental work.

FOREST TREE PLANTING.—Mr. Schinckel thought the Naracoorte farmers dilatory in the matter of planting forest trees. It was one of the bleakest districts in the State, and it would be well if the members of the Bureau set an example and ordered a quantity of trees from the Forest Department. Mr. Bates thought

it would be a good thing for the council to take up, but Mr. Schinckel considered it equally the work of the Bureau. Mr. Buck said that Mr. Pustkuchen's farm at the Bald Hills, where a few years ago there were no trees, had been made beautiful by tree-planting. Mr. Wardle supported Mr. Schinckel. The natural timber was getting less every year, and it was time to do something. He had sown gum and wattle seed broadcast some years ago, and some splendid trees were the result. He advised others to do the same.

Paskeville, June 8.

Present—Messrs. A. Goodall (chair), T. H. Price, A. Palm, W. Westphall, G. Meier, H. Koch, J. P. Pontifex, R. Hamilton, P. A. Blackman, W. S. O'Grady (Hon. Sec.), and four visitors.

MANURES.—Chairman was trying varying quantities of super. per acre this season, but can see no difference as yet. Experience of previous two years had proved that the heavier dressings gave the best results in the first year, even when the season was dry; but last year the heavily-dressed crops suffered from the frost [coming on when the plants were in bloom—GEN. SEC]. Mr. Koch had the same experience, especially on the lower lands. Mr. Allen (a visitor) said he applied about 56lbs. super. per acre on some of his earliest-drilled wheat, and got 9bush. per acre; on the later crop he drilled 80lb. and got 3bush. It was all fallowed land. The frost cut the younger and more luxuriant plants more severely than those that were older and less sappy.

OFFICERS.—The Chairman and Hon. Secretary were thanked and re elected.

ANNIVERSARY AND ARBOR DAY.—This was the tenth anniversary of this Branch, and it was celebrated by an arbor day, when the members, the school children, and others planted a lot of eucalyptus, pines, &c., around the public school and the recreation ground. Games and sports were conducted in the open air until evening, and then all parties—about 200 in number—were treated to a bountiful spread provided by the ladies. Then the youngsters had an hour or two for fun, interspersed with cakes, lollies, and fruit, and after they had been sent off to their beds the older boys and girls and adults had a good spell of dancing.

Angaston, July 20.

Present—Messrs. F. Thorne (chair), R. Player, A. Sibley, A. Friend, J. Heggie, S. O. Smith, J. H. Snell, W. Sibley, J. Vaughan, E. S. Matthews (Hon. Sec.), and one visitor.

BEST-KEPT VINEYARD.—Prizes having been patriotically offered through the medium of this Branch by Mr. Seppelt and the Adelaide Wine Company for the best-kept vineyard in the Barossa District, Messrs. F. Thorne and S. O. Smith were appointed a committee to further the object sought.

EXPORT APPLES.—This Branch condemns the Hoover as an apple for export purposes.

Balaklava, July 13.

Present—Messrs. P. Anderson (chair), A. Manley, J. Crawford, J. Vivian, A. W. Robinson, C. L. Reuter, W. Smith, E. Hams, G. C. Neville, G. Reid, W. Tiller, E. M. Sage (Hon. Sec.), and one visitor.

ANNUAL REPORT.—Ten meetings holden, with an average of ten members. Two papers had been read, and many discussions on practical subjects had taken place.

KING'S EARLY WHEAT.—The Hon. Secretary called attention to a statement by Mr. Marshall in the public press that Professor Lowrie, acting on the advice of the corn-trade section of the Chamber of Commerce, had allowed the wheat known as King's Early to go out of cultivation. He wished to know if this is correct? [I have the Professor's authority for saying that he has *not* allowed the wheat called King's Early to go out of cultivation on the College Farm.—GEN. SEC.]

PROFESSOR LOWRIE.—Members regret that the State is about to lose the valuable services of the Professor of Agriculture.

VISIT TO A GOOD FARM.—Hon. Secretary reported having visited Mr. H. B. Moody's farm on Grace Plains. The string binder is used to harvest as much of the crop as possible, and the grain is thrashed with the header. Mr. Moody gets more grain, and of a better quality than with the stripper, and also saves the straw and chaff, which are good food for the stock. He had successfully fed 500 sheep this year on the headed chaff, and, although they were shy at first, they soon became quiet enough to feed. Mr. Robinson considered headed straw of very little use for feeding horses, unless plenty of good hay was mixed with it.

Port Lincoln, July 19.

Present—Messrs. J. P. Barraud (chair), E. Chapman, W. E. Goode, J. C. Richardson, R. Puckridge, J. D. Bruce, J. O'Shanahan, and J. Anderson (Hon. Sec.).

PRICES OF BRAN AND POLLARD.—In answer to a question as to the high prices of bran and pollard in comparison with the price of flour, the Hon. Secretary explained that the supply of bran and pollard is entirely dependent on the demand for flour. The export of flour has decreased, whilst the demand for bran and pollard has greatly increased. Mr. Goode considered the prices much too high, and advocated establishment of a local mill, but the other members thought it would not pay farmers in so wide a district to cart wheat to a central mill, even if there were enough of it to keep the mill going. Mr. Anderson advised farmers to crush as much of their wheat as they could feed with advantage to their stock. Wheat was much cheaper than bran or pollard.

WILD DOGS.—Mr. J. D. Bruce strongly advocated that no scalp-money should be paid within vermin districts for destruction of dingoes or wild dogs, but that each owner should be made responsible for the destruction of dogs on his own land. Most of the members considered that, owing to the apathy and carelessness of many of the landholders, the dogs within the enclosed areas would never be exterminated unless scalp-money were paid, or men were employed wholly or partly on wages to destroy them.

Hartley, July 24.

Present—Messrs. J. Stanton (chair), J. Jaensch, W. Klenke, A. Thielc, B. Wundersitz (Hon. Sec.), and one visitor.

FALLOW.—The Hon. Secretary read the following paper:—

Many farmers still follow the old plan of simply ploughing the land, and leaving it untouched through the summer and autumn to become thoroughly dry to the bottom. When seeding time arrives they scarify or plough it again. All fallowing should be done during July and August; ploughed 4in. to 6in. deep, according to the nature of the soil. Stiff clay requires deeper ploughing than a soil that is light or sandy. Harrow it as soon as ploughed. In September or October weeds will probably appear, when a cultivator or scarifier should be run over to a depth 2in. or 3in. If heavy rain should fall later on the field should be harrowed every time to keep the surface loose and pulverised. This will prevent the escape of moisture by capillarity, and will be as good as several inches of rain the following season.

Mr. Thiele thought the more the fallow is worked the greater the number of weeds that will grow; but the majority of members agreed that working the fallow is beneficial. Early fallow is best, but it could also be fallowed later if fed down short by sheep. It should be ploughed deep without turning the subsoil to the surface. When sowing time arrives plough or scarify the land, and then drill in the seed.

Finniss, July 1.

Present—Messrs. Jas. Chibnall (chair), A. Green, T. Collett, H. Langrehr, W. W. Heath, and S. Collett (Hon. Sec.).

EXHIBIT.—Mr. H. Langrehr tabled an excellent sample of well-cured Sultana raisins.

SHEEP ON FARMS.—Members consider that every farmer should keep more or less sheep, for rations, and for export of lambs. Ewes should be large-framed, crossbred, or by preference Merinos, on account of the better class of wool, but they should be mated with a Shropshire ram.

Burra, July 19.

Present—Messrs. F. A. S. Field (chair), F. G. Dawson, Jas. Scott, E. Goodridge, Jos. Flower, J. H. Arnold, W. Heinrich, A. McDonald, W. G. Hawkes, F. Duldig, and R. M. Harvey (Hon. Sec.).

SHEEP MANURE.—Mr. Hawkes stated that during a recent visit to the North-East he had been shown a large heap of sheep manure about thirty years old, and asked whether any use could be made of it by farmers. It would cost about 50s. per ton to deliver it at Burra. Mr. Flower would not care to use it while he could get mineral phosphates, as his experience was that it required a heavier rainfall than they were favored with. Splendid growth would result until the dry weather sets in, after which the crop goes off quickly, while that manured with phosphate stood the dry weather, and gave much better results. The experience of other members was similar.

Johnsburg, June 29.

Present—Messrs. G. H. Dunn (chair), A. Napper, L. Chalmers, J. Sparks, P. Caughlan, T. Potter, W. McRitchie, T. Johnson (Hon. Sec.), and one visitor.

"THE PRINCIPLES AND PRACTICE OF HORSE-BREEDING."—Mr. W. Buchanan forwarded a paper to the following effect:—

The precarious climate of this locality makes the rearing of young horses very difficult; but there are portions of the State much more favorably circumstanced. The difficulty of breeding good stock is increased in nearly all localities by the presence of many travelling mongrel sires. As to whether the character of the sire or the dam—either or both—have any influence upon their offspring has been a matter of dispute with some people. Some contend that the influence of the male is everything, whilst others argue that the female is the principal agent in determining the character of her offspring. This, however, is a subject to be determined by results of extended observation. So far it seems to be proved that the sire has most influence upon the form or shape of the colt. This is shown plainly in the mule, which shows more of the ass than of its mother the mare. In the sheep it is proved that the qualities of the ram preponderate in the offspring. The offspring of a pony mare is very much larger than the dam when the sire is a big animal; but the colt from a large mare is quite small when the sire is a small horse. If there are any exceptions they only prove the rule. These facts do not just justify the conclusion that "any mare that is unfit for any other purpose may be worth something for breeding." It would be better to destroy her than to perpetuate her faults and defects. The defects of the mare are quite as likely to become hereditary as are those of the stallion, and constitutional defects—such as a scrofulous disposition, &c.—are

more likely to be derived from the mare than from the horse, because the intimate connection between the mare and foetus is considerable before birth, and is continued afterwards by means of the milk. A bad mare scarcely ever produces a good colt, however excellent the colt may be; therefore the benefit from the introduction of a superior stallion into a district where the mares are of inferior stamp will not be visible for several generations. The Arabs will never sell their favorite mares, although they freely part with the stallions; and this fact may account for their retention of their famous breed without any deterioration. While they have good mares they cannot have bad horses; but if they allowed their mares to degenerate the good qualities of their entires could not have supplied the deficiency. Breeders of blood horses have for generations paid marked attention to the perfections of both sire and dam, with the result that blood horses are fleetier and have better staying power than any other breed. Our farmers regard horse-breeding as being unprofitable, but this may be attributed to uncertain rainfall in some places, or to the fact that the holdings are too small, or to want of judgment where the other conditions do not prevail. For farm horses, it would be well to breed them to 15 hands or 15½ hands high. With careful regard to the qualities of sire and dam, progeny may be secured of an active, wiry nature, capable of doing twice the amount of work than can be got out of the heavy, hairy-legged sorts. By getting more "breed" a greater degree of nervous energy is obtained, and the horse is less likely to tire. It is not a good plan, however, to put a draught mare to a thorough-bred horse, as the progeny is likely to show the long legs of the sire with the heavy body of the mare. Breeding animals suitable for hunters, carriage horses, and remounts will be found very profitable. Such horses should be 15 hands high, with deep chest and barrel, not too short in the back, with strong loins and quarters, good forearm and legs, light head and neck, and the neck not too short. He should be able to carry weight, and have good action. The dam for the production of such a horse should be from 15½ hands to 16½ hands high, half-bred, not blind, unless from accident, because disease of the eye is often hereditary. She should be of good shape, not too long and oblique, nor too short or upright, not too light in carcass, nor washy, with good paces, and if she has been a good mother, so much the better. The sire should be a thorough-bred, of good constitution, with good legs, a large frame, and with a record of performances to prove that his large frame was no hindrance to him. The result of this combination should be the production of animals of great value. If the mare should be small and thoroughbred, the horse should be larger, of more substance, and may be half or three parts bred, if his action is good. Such horses are always saleable at good prices. Breeders should be most careful, and use their best judgment when selecting sires. What though the cost of service may be greater than for that of a second-rate horse, the result of the greater expenditure will be amply returned in the end. The progeny will be far more valuable, the cost of keeping it will be no greater, but the work done by it will be much greater, and more reliable than that from the progeny of the cheap sire. Breeders should discourage the use of the inferior travelling sires. The following are some of the points which characterise a good horse:—Plenty of breadth and fullness between the eyes, a short straight back, a straight rump; eyes full, and a hazel color is considered good; small thin ear, well thrown forward; straight elegant face, square muzzle, with large nostrils for filling the lungs. The wither should be high, shoulders well set back; broad, but not too deep chest. The underside of the head of a good horse should be well cut under the jaw, with jawbones broad and wide apart under the muzzle. The fore legs should be short, a pretty straight hind leg, with hocks low down, the pastern of good length, and a medium broad foot.

In discussion, members considered that the progeny from a thoroughbred horse and a good draught mare would produce a really good quality farm horse, active, and capable of plenty of work. If the offspring should be a filly, she could be mated with a draught stallion, and the result would be highly satisfactory.

ANNUAL REPORT.—Owing to dry season some of the members have been unable to be present at all the meetings, but there were eleven meetings with an average attendance of nine members. Fourteen visitors attended during the year, and two papers were read. The *Journal of Agriculture* has imparted much valuable information in the district, and is much appreciated by everyone. Many interesting exhibits of products have been tabled, and numerous instructive discussions have taken place upon practical matters. Several members are conducting experiments with fertilisers. The season has been most unfavorable for the tests of seeds of cereals and vegetables sent up by the Central Bureau.

OFFICERS.—The Chairman and Hon. Secretary were thanked for past services and re-elected.

Clarendon, July 8.

Present—Messrs. J. Pelling (chair), J. Spencer, J. Pigott, A. A. Harper, W. Spencer, A. Harper, W. A. Morphett, and A. L. Morphett (Hon. Sec.).

SAND IN HORSES.—A question was submitted as to what is the treatment necessary when a horse becomes sanded, and members referred the matter to the General Secretary. [This question has been answered time after time. Why do members fail to read their *Journal*? When a horse is sanded give a wine bottle of yeast, then throw the horse on its back, roll it from side to side, rub the belly or knead it with the hands to shake up the sand. Then inject, per rectum, a few gallons of warm water, comfortable to the hand. When the horse rises most of the sand will be voided. Then give a feed of pollard damped with warm water. Or (2) give a hot bran mash on an empty stomach, followed by a good feed of pollard and water mixed to the consistency of gruel.—GEN. SEC.]

PRUNING FRUIT TREES.—Mr. J. Pelling read a short paper on this subject. At planting, the trees should be pruned to a good shape and be well balanced; put in a stake, plant the tree, and tie it properly to the stake. It is important to secure sturdy limbs to bear the branches, and this can generally be secured by careful early treatment. The centre should be kept open and all crossed branches suppressed. [Every fruitgrower should at once secure a copy of Mr. Geo. Quinn's pruning book, price 1s., at the Agricultural Bureau office; postage costs 3d. extra.—GEN. SEC.] Several members deprecated the digging of deep holes in which to plant trees, as the holes fill with water in wet weather and kill the roots, whilst in summer the soil opens round the sides of the hole and the heat and dryness destroys the tree, and at all times the roots fail to penetrate the walls, and ramify the broken soil within the limits of the hole. The whole of the orchard should be broken up.

Port Broughton, July 1.

Present—Messrs. W. R. Whittaker (chair), W. Tonkin, B. Excell, G. Pattingale, W. Dalby, E. Dennis, A. H. Dolling, E. Dalby, F. Gardiner, and Jas. Barclay (Hon. Sec.).

SHEEP.—A discussion took place on sheep, and the most profitable breed to keep. The opinion that the Merino was best was general. Mr. Pattingale tabled samples of wool.

STRAW.—A discussion took place on the value of straw for feeding purposes, and it was agreed that it pays farmers to save as much straw as possible for this purpose.

Yorketown, July 20.

Present—Messrs. J. Koth (chair), A. Jung, C. Domaschenz, J. Latty, S. Vanstone, A. E. Anderson, G. Bull, B. Lloyd, J. Davey (Hon. Sec.), and one visitor.

ANNUAL REPORT.—The Hon. Secretary's annual report showed that nine meetings had been held during the year. The average attendance had been fair, one paper had been read, and matters of local interest discussed to the advantage of members. Seeds of wheat from Central Bureau had been received and tested, with sufficiently satisfactory results to warrant tests on a larger scale. Mr. J. Koth and J. Davey were re-elected Chairman and Hon. Secretary respectively.

WEEVILS IN BARNS.—Mr. Lloyd found that spreading a little superphosphate on the barn floor was effective in getting rid of weevils.

Kanmantoo, June 27.

Present—Messrs. Thos. Hair (chair), E. Downing, Jno. Mullins, J. Hair, and three visitors.

SHEEP-FEEDING.—A discussion took place on the practice of feeding ewes and lambs during seasons of scarcity. In seasons like the present most farmers have suffered considerable losses of lambs, and in some instances hoggets have succumbed. Members generally approved of the idea of helping the sheep over the critical period by means of hay or chaff, and consider it profitable to do so, particularly with sheep so high in price. Not only are losses prevented, but breaks in the fleece are averted.

MANURING OF PASTURE.—Quite a variety of opinions were expressed as regards the effect of manures upon grass, some members being of opinion that a repetition of manuring would check the development of indigenous grasses, while others held the opposite to be the case.

Bakara, June 28.

Present—Messrs. H. Barrow (chair), J. Roy, H. R. Haywood, R. Wilson, F. E. H. Martens (Hon. Sec.), and three visitors.

HORSE-FEEDING.—One of the visitors said that kind treatment had nearly as much to do with the appearance of the horse as the feeding. He did not think it safe to let the horses have water when they are hot.

Port Elliot, July 27.

Present—Messrs. J. McLeod (chair), J. Brown, J. Nosworthy, J. R. Coote, C. Gosden, H. Welch, F. Basham, and E. Hill (Hon. Sec.).

SHEEP ON FARMS.—Members agreed that it would be profitable to keep sheep on any farm, according to its area and grazing capacity, outside or apart from its needs for crop production; and that it would be a wise proceeding to feed the sheep to a reasonable extent on chaffed hay at times when the natural pastures do not produce sufficient feed to maintain the animals in fair condition; but members have hitherto given very little consideration to this subject.

DAIRY COWS.—Mr. McLeod considers that the Jersey breed of cows is too delicate in constitution for this locality, and prefers a cross between the Ayrshire and Jersey. By giving a handful of bonemeal occasionally to the cows, the craving for bone-chewing would be taken away. Copra cake in small quantities has a beneficial effect on the health and appearance of the cows, and imparts a gloss to their coats.

Stansbury, July 20.

Present—Messrs. C. Faulkner (chair), G. Jones, P. Anderson, J. Sherriff, J. Henderson, J. Antonio, G. Brundell, and P. Cornish (Hon. Sec.).

DISEASED COW.—Mr. J. Antonio was advised to use lard or butter mixed with sulphur for cure of pustules on udder of a cow.

MANURES FOR GRAPE VINES.—Mr. P. Anderson desires that Branches will discuss the values and proportions of supers., bonedust, guanocs, and other artificial or natural manures for vines, especially young vines.

EXPERIENCES WITH FERTILISERS.—It was decided that each member should give a report of his experiences with artificial manures of all kinds, the quantities of each used per acre, the treatment of the land, nature of soil, and actual results of crops, straw, grain, &c., and that other Branches should be asked to give similar information. [Will Hon Secretaries of other Branches please take note of this valuable suggestion?—GEN. SEC.]

Carrieton, July 25.

Present—Messrs. J. B. Harrington (chair), W. Steinkc, W. J. Gleeson, F. Vater, G. Marten, N. Travers, H. Menz. and J. W. Bock (Hon. Sec.).

PROFESSOR LOWRIE.—Members expressed their regret that Professor Lowrie was about to sever his connection with the Agricultural College.

Forest Range, July 25.

Present—Messrs. J. Rowley (chair), G. Monks, J. Green, A. Green, W. McLaren, J. Caldwell, A. S. Gunning, H. H. Waters (Hon. Sec.), and two visitors.

POULTRY IN THE ORCHARD.—Mr. McLaren read the following :—

In common with many others he had entertained the opinion that poultry were the enemy of the gardener, especially if the birds belonged to a neighbor and they strayed on to his premises. Under some circumstances that opinion might have been justified, but experience had taught him that poultry, in conjunction with the orchard, was likely to be beneficial as well as profitable. Whenever an orchard is planted there is sure to be a lot of grubs, caterpillars, worms, beetles, and other entomological pests. In a place that was being irrigated he saw thousands of grubs, beetles, &c., driven out of the ground as the water soaked in. In such a case ducks destroyed no end of the gardeners' enemies. A friend always reared a lot of young ducks for this purpose, and, with a little supplementary food, they soon became large enough for marketing, thus getting his orchard cleared of pests and making a profit as well. Very possibly a good flock of ducks in the orchard would help to keep the codlin moth in check—at any rate they would destroy a good many insects. Fowls delight in scratching up freshly-broken soil, amongst leaves and all kinds of rubbish beneath the trees where the caterpillars of codlin moth may be found before they can hide in a more secure place. When there are raspberries or other fruits that would be attacked by the poultry, the birds must of course be shut up—to allow them to remain would be bad management indeed. One hundred yards of 5ft. wire netting will make a yard large enough to enclose a good many fowls; but there should never be too many of them for proper management. The yard should be close to the orchard, or even in the orchard, if there is nothing the birds can injure. They will naturally roost in their yard, and when it becomes necessary to shut them up, just close the gate one evening. It is a good plan to have a lot of broods of chickens hatched about the time the codlin moth begins to appear. The chicks should be hatched in different parts of the orchard, and the hens will always return to the hatching-place at night, so that hens and chickens can be removed to the yard when it is no longer prudent to let them remain in the orchard. Some of the breeds would need to have their wings clipped at this time, else they would fly over the enclosure; but some of the heavier breeds would not require to be thus treated. The breed should be pure, whether the fowls be kept for egg-production or for table purposes. [For advice on this matter read some of the recent articles by Mr. D. F. Laurie in this journal.—GEN. SEC.] He preferred Minorcas and Wyandottes in the orchard.

Lyndoch, June 27.

Present—Messrs. H. Kennedy (chair), T. Warren, J. M. Sim, R. Loveridge, J. W. Thomas, W. J. Springbett, and one visitor.

SELECTION OF SEED WHEAT.—Mr. Sim read a paper on this subject, which was well discussed. [But as copy of paper has not been supplied, members of other Branches are unable to criticise it.—GEN. SEC.]

Kadina, July 27.

Present—Messrs. F. M. Rendell (chair), D. Taylor, D. F. Kennedy, H. Johnson, M. Quinn, F. H. Warren, and J. W. Taylor (Hon. Sec.).

POULTRY.—At the previous meeting, on June 6 [report of which reached me July 30—GEN. SEC.], the second part of a paper on "Poultry," by the Hon. Secretary, and another paper on the same subject by Mr. Kennet, was read, and at the present meeting the third part of Mr. Taylor's paper was read, and the whole series was to be discussed; but time would not allow of this. Mr. Johnson, however, remarked that during the past six years he had only marketed fifty bags of wheat, but for years he had lived on the produce of his fowls and four cows. He had taken up a trifle from his storekeeper, instead of paying him a cheque. The eggs he took to market went six to the pound. Members recommended families paying more attention to poultry.

Brinkworth, June 28.

Present—Messrs. A. L. McEwin (chair), S. Auger, J. Cross, J. Graham, A. W. Morrison, C. Ottens, H. Shepherd, W. Wundke, W. Welke, H. J. Welke, G. Wooldridge, W. H. Pearce, J. Stott (Hon. Sec.), and two visitors.

"DO TREES ATTRACT RAIN?"—Mr. A. L. McEwin read a paper on this subject, as follows:—

We hear a great deal about trees attracting rain, and quite recently one writer in the *Register* went so far as to state that if the Ninety-mile Desert in the South-East were cleared for agricultural purposes it would practically turn the south-east portion of the colony into a desert, for the want of rain. At the outset I may say that I am very sceptical with regard to trees affecting the rainfall; in fact would go so far as to say no effect at all. This conclusion I have arrived at from observation. And in the first place I ask what was the average rainfall of the colony fifty years ago compared with the present? I have not the statistics to hand, but, quoting from memory, there is very little difference in the average for a period, certainly not more than 2in. The statistics, I take it, are based on the rainfall at the Adelaide Observatory. Now what are the conditions about Adelaide to-day? I venture to say there are more trees at the present time than ever there were at any time, consequently, if trees have any effect, there should be an increase in the fall. But let us look at the conditions of other parts of the colony. Take the South-East and go right to the lower part of the colony; they have been having less rainfall there than in years gone by, and the very portions of our colony that have always had abundance of rain have in like manner, comparatively speaking, been having a dry time; yet in many instances the timber is thicker to-day than ever it was known to be; the trees having increased, not decreased. If we take the Far North into consideration—there has been practically a drought for years—yet there trees have not diminished, or certainly not enough to have any effect on the rainfall. Now let me draw attention to the agricultural areas, or, say, Yorke's Peninsula, and go right east to the Murray. What do we find? There thousands upon thousands of acres of land have been cleared of the mallee scrub, only small patches and strips left at the present time, but do we find conditions of rainfall any worse? If we take other parts of the colony as a guide and allow for different conditions of latitude, &c., they compare very favorably. The fact is that over the whole of the colony, whether north or south, there has been a period of comparatively dry seasons; but there is nothing to prove that the land that has been cleared from timber has had any effect on the rain or had anything to do with it. Whether did the rain follow the trees or the trees the rain? No question but the rain fell first. The trees are an indication that plenty of moisture is to be had, also that the soil is adapted for their growth, and I question very much whether the soil has not a great deal more to do with it than the rain. If we take any part of the colony, and travel east and west, we cannot travel many miles in the same kind of timber, except in the mallee, and even there we find the mallee varies according to conditions of soil, and plains intervene, showing that the soil in some way is not adapted to growing trees. The mallee country is usually level, though they are sometimes found on the hilly ground; we also find, in many instances, the very best land without trees, and as good a rainfall on treeless country as where there are trees. If trees have any effect on the rainfall the mallee country away to the east on the Murray flats should have abundance of rain, while that treeless country extending from Hill River to the Burra and northwards, taking in those fine areas such as Gulnare and Belalie, should have no rain, while the reverse is the case. How is it that very heavy land at the foot

of the ranges, extending from Adelaide northwards (in fact I might take in a great deal of the hills, say from Adelaide to Gawler—some of the finest land in the colony) is destitute of timber, while out on the level country is the mallee on poor soils; yet in every case the rainfall is heavier towards the hills than on the level timbered country? Starting from Wallaroo and travelling eastwards, we find the rainfall varies very much—the country with the most timber not coming out on top by any means, but the higher or hilly country, showing that the only condition that affects the rainfall is the higher altitude and proximity to the coast. Sir Charles Todd's forecasts are a proof of how much the rainfall depends on the trees of the colony. He reports, perhaps, say, fine weather, with new low area pressure coming up from the Leeuwin; then probably we learn next day it has not been strong enough to get well up into the Great Australian Bight. The consequence is it passes south altogether, and neither tree nor treeless country, nor high nor low country gets any of it. This is a proof that we are dependent on storm pressures from the south, with energy enough to get well up into the Bight, which is the farthest inland point of the sea, for South Australia to get its rains distributed over the interior of the colony. Take Australasia as a whole, and it matters not whether north, south, east, or west, proximity to the coast, together with higher land, is the only factor that guides the rainfall. (One has only to look at the map and see how it is that South Australia is badly situated for a low rainfall, and, being practically a level country, we have no heavy rainfalls, not even in our most southern parts, only at periods. It is also well known that heavy rains on our high lands or on our hilly country give plenty of rain on the low-lying country. If trees have such an effect on the rainfall of the country, how is it that one year we have 20in. of a rainfall, while the following there is only 12in.?) In all parts of the world we know that the seasons vary, and that there are not two seasons alike as to conditions; but we do know that seedtime and harvest time are given us; summer and winter do not fail, though at times they are indifferent ones. Some may contradict this, because they attempt to grow wheat where nature never intended, instead of remembering that there are other harvests beside wheat. I know that this paper is against the general idea, and will certainly not be popular. There are one or two things in connection with this subject I would like to call attention to, time compelling me to cut it shorter than I would wish. They are these:—What would our railways be carrying to-day, what would our ports be doing, and what population would South Australia have to-day if it required the leaving of all her timbered country to produce a fair rainfall on the rest of it. There is an idea abroad that in a few years there will be no timber for firewood. This was said thirty years ago, yet firewood in Adelaide is cheaper to-day than it was then, and this I am prepared to prove. This applies to all timber, and, even if firewood should get dearer, we have the satisfaction of knowing that coal is to be had in the colony, so that we shall have something to fall back on to keep ourselves warm. We have prophets in abundance with regard to the weather and seasons. Some will say I am one of them; but I ask any person who feels disposed to take note of the following:—If between the 15th and 25th of March, inclusive, we have fine, dry, clear, calm weather, it will be a dry season; if stormy, rough, disturbed atmospheric conditions, a fairly wet season; if thunderstorms and heavy rain, a very wet season. After eighteen years' observation, I have not known those indications to be wrong. Whether meteorologists consider the equinox is any sign of the weather that is to follow I should like to know; but perhaps it would be interesting to turn to records of the weather for say the last ten years on the periods I have mentioned and note the kind of season that has followed.

Mr. McEwin's paper was unexpected by the members, who had arranged to hear one by Mr. Everett on "Farm Life," and consequently they were not prepared to discuss it. Seven of his audience were carried away by his arguments [with which, however, I do not agree—GEN. SEC.], and four opposed his theories and deductions therefrom.

GIDDY CATTLE.—Mr. McEwin said a steer of his, about eighteen months old, has a habit when walking of turning around five or six times, and then going on again. Other members mentioned the same peculiarities with some of their cattle. Mr. G. Wooldridge had one die, which latterly used even to revolve after falling down. [The brain should have been examined after death, when inflammation might have been found, or perhaps hydatids.—GEN. SEC.]

INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

Number of Persons Registered and Found Employment by Government Departments and Private Employers from June 28 to July 30, 1901.

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youths	124	193	198
Masons and bricklayers	5	—	20
Stonecutters	1	—	5
Plasterers	1	—	1
Carpenters and joiners	6	—	2
Painters	3	2	2
Plumbers and ironworkers	3	1	—
Boilermakers and assistants	2	2	3
Blacksmiths and strikers	6	1	2
Iron and brass moulders	2	1	1
Fitters and turners	7	1	—
Enginedrivers and fireman	2	—	—
Furnacemen	2	—	—
Driller	1	—	—
Tinsmith	—	1	—
Shipwright	—	1	—
Storeman	1	—	—
Compositors	6	—	9
Baker and cook	3	—	—
Gardener	1	—	1
Carriage trimmer	—	—	1
Apprentices	16	3	4
Cleaners	12	22	—
Porters and junior porters	22	22	2
Rivet boys	3	—	1
Totals	229	250	252

July 30, 1901.

A. RICHARDSON, Bureau Clerk.

The Factories Acts.

CONTRIBUTED BY CHIEF INSPECTOR BANNIGAN.

(Continued from page 1037, Vol. IV.)

When an inspector considers that in a factory a vat, pan, or other structure which is used in the process or handicraft carried on in such factory, or any stairway, staging, or other place, and near to or over or on which persons are liable to pass or to be employed, is so dangerous as to be likely to be a cause of bodily injury to any such person employed in the factory, he shall serve on the occupier of the factory a notice requiring him to fence or safeguard such vat, pan, structure, stairway, staging, or place.

The provisions of the Act with respect to the fencing or safeguarding of machinery which an inspector considers not to be securely fenced or safeguarded, and to be dangerous, shall apply to such vat, pan, structure, stairway,

staging, or place; and if the occupier of a factory fails constantly to maintain the fencing or safeguarding required by such notice in an efficient state, the factory shall be deemed not to be kept in conformity with this Act.

The Minister may, on complaint by an inspector, and on being satisfied that any machine used in a factory is in such a condition that it cannot be used without danger to life or limb, by order prohibit such machine from being used, or (if it is capable of repair or alteration) from being used until it is duly repaired or altered to the Minister's satisfaction, on the report of the inspector. Any employer who disobeys such order shall for each offence be liable to a penalty not exceeding ten pounds for every day on which the machine is used in contravention of the order.

The Governor may, by Proclamation in the *Government Gazette*, prohibit the employment in any factory of any person under the age of 16 years at all or in any operations at or in connection with which any dangerous machinery is used.

In every factory the opening of every hoistway, elevator, lift, wellhole, or stairway, shall at each floor be provided with and protected by good and sufficient trapdoors or self-closing hatches and safety catches, or by such other safeguards as the inspector may approve.

If an elevator or lift in a factory is considered by an inspector to be unsafe or dangerous to use, he may prohibit the occupier from using such elevator or lift until it is made safe to the inspector's satisfaction. Should any occupier use, or permit to be used, such elevator or lift at any time whilst its use is so prohibited he shall be liable to a penalty of twenty shillings for each time such elevator or lift is so used.

No male under 16 years of age nor any female shall be allowed to have the care, custody, management, or working of any elevator or lift in any factory.

No male under 18 years of age nor any female shall be allowed—

- (a) To clean such part of the machinery in a factory as is mill gearing, while the same is in motion for the purpose of propelling any part of the manufacturing machinery; or
- (b) To work between the fixed and traversing part of any self-acting machine while the machine is in motion by the action of steam, gas, oil, electric, water, or other mechanical power.

Any occupier who allows any employé to act in contravention of this section shall be guilty of a breach of the Act.

Where there occurs in a factory any accident which either (a) causes loss of life to an employé in the factory, or (b) causes bodily injury to any employé in the factory, written notice of the accident shall forthwith be sent by the occupier to the nearest inspector, stating the cause of death or the nature and extent of the injury, as the case may be, and the residence of the person killed or injured, or the place to which he has been removed; and if the notice is not sent the occupier of the factory shall be liable to a penalty of not exceeding Five Pounds.

The inspector shall, immediately on receiving such notice, proceed to such factory and inquire into the cause of such accident, and may examine the occupier and all persons employed in such factory, and report the result thereof to the Minister.

The Board may, on the application of any employer affected, modify or annul the terms of any decision or notice given by any inspector under this part of the Act.



Journal of Agriculture

AND

Industry.

No. 2. REGISTERED AS SEPTEMBER, 1901. [A NEWSPAPER. VOL. V.

NOTES AND COMMENTS.

While the weather during August has in the Lower North and Southern districts been in marked contrast to that of last year, when we had in most parts a record rainfall, the past three weeks has completely changed the aspect of affairs in the Far North. Both the fringe country, as it is called, and the pastoral districts further out have experienced splendid rains, and the soil has received a thorough soaking, from 2½ in. to 4 in. having been recorded in the driest of the agricultural areas. The West Coast districts also shared in the general fall, which, however, has not been so heavy in the Central District. With the warmer days and shorter nights feed and crops will now make rapid progress. With a few good showers and cool weather during the next few weeks, a fairly good harvest may yet be reaped in the far northern areas. A good soaking rain is needed in the later districts to secure the crops against the effects of hot winds, and also to provide a supply of moisture in the subsoil for fruit trees and vines. The cold dry winter has had a marked effect on the supplies of farm by-products, but larger quantities of butter and eggs are now being produced.

The export of refrigerated produce from Australia has assumed immense proportions, and with reasonable treatment there is no reason why it should not still further expand. With fruit in particular we should see a very large development in the course of a few years, though the action of the shipping companies is the reverse of encouraging. The freight and lighterage charged by the mail companies has been 90s. per ton, while other lines have carried fruit at 10s. to 15s. per ton less. Owing to quicker delivery, and to the fact that they carried the fruit in good condition, shippers have always supported the mail boats, though of opinion that, compared with other produce, the freight was excessive. It is stated that, with one exception, the outside companies have raised their charges equal to the mail companies. This means that the growers must be content to accept less for their fruit, or combine and offer the whole of their freight to those companies who will offer reasonable terms. The Hon. Minister of Agriculture is communicating with the Ministers in the other States with a view to securing united action, and has called a public meeting of fruit exporters to consider the matter here.

Considerable quantities of wheaten chaff have been shipped of late from this State to Victoria. Recently one steamer took nearly 10,000 bags of chaff. This unusual development has been caused by the large exports of oaten chaff to South Africa, and the consequent rise in price. Our wheaten hay is refused by the War Office authorities as unsuitable for army purposes, an action which our farmers find it difficult to understand. The consequence has been that while chaff has become comparatively scarce in the adjoining States, South Australia has a good supply available. The Minister of Agriculture has arranged to send a few tons of good wheaten hay to South Africa with a view to demonstrating that the objection to it is unwarranted.

Reports from Queensland indicate that cattle ticks are gradually advancing southwards again, and are approaching the New South Wales border. It has been very generally held that stockowners in the southern States and in the drier districts had little to fear from this pest owing to climatic conditions, and the experience of the past few years has certainly supported this view. Recent inquiry, however, particularly by Professor Lignières in Texas, throws considerable doubt on this point, and it is now asserted by prominent authorities that the climatic conditions of these States are no bar to the advancement of the ticks southward. If this is correct, united and prompt action will be necessary to prevent the invasion of new districts.

The question of the damage to hides by branding on the ribs or rump of cattle has received considerable attention in Australia of late years. The annual loss owing to the best part of the hide being damaged by the brand has been put down at a very high figure, and only last month a deputation from the Master Tanners' and Curriers' Association of Sydney, in urging the necessity for some alteration in the place of branding, stated that the depreciation averaged fully 3s. per hide. This subject seems fraught with many difficulties. The brands, to be of any value, must be in a prominent position, and if the suggestion to place them on the neck or cheek were adopted, it is questionable whether this first essential would be secured. It was stated by the deputation referred to that Australian hides are sold in English and Continental markets at minimum values on account of the brands, and the *Pastoralists' Review* suggests that if this is correct that there must be some better system of branding in vogue in America and Argentina, where cattle are bred in immense numbers, and where the danger of loss by stealing is no doubt as great as in Australia. It would be well, therefore, for some inquiries on this point to be made by the proper authorities. One thing is certain: if it can be demonstrated that this loss of 3s. per hide can be prevented without interfering with the efficiency of the brands, our cattle-breeders will not be slow to change their methods.

The quantity of flowers for decorative purposes sent to London is simply enormous. On one day in March a single train conveyed 27 tons of flowers; they were shipped from the flower farms in the Scilly Islands, and as each package weighs only a few ounces, some idea may perhaps be formed of the enormous bulk represented in 27 tons. A steamship brought the flowers

from the Scilly Islands to Penzance, where the huge floral consignment was smartly taken in hand by the railway officials, and early in the evening a special express train, containing nothing but flowers, was speeding its way to London. It is said that over £1,000,000 is spent by Londoners for flowers yearly.

In a notice of the Bodalla dairy farm, in the New South Wales South Coast district, the *Sydney Stock and Station Journal* reports that the Bodalla herd numbers 630 milking cows, consisting of 110 Holsteins (a comparatively recent importation from North Germany), 160 Ayrshires, 150 Shorthorns, 130 "grades," and eighty Jerseys. The 110 Holsteins yielded last year 61,269galls. of milk, being 554·8galls. per cow; the 130 "grades" gave 67,499galls., being 519·22 for each cow; the 150 Shorthorns, 77,168galls., or 514·46galls. per head; the 160 Ayrshires, 72,446galls., or 432·8galls. each; and the eighty Jerseys, 28,845galls., equalling 350·66galls. each.

It is a recognised fact that grasses become thicker, or produce more stems and blades, after having been grazed by cattle, sheep, &c., and gardeners use lawn mowers with the object of making a dense sward. Grazing or mowing delays the maturing of the grass. Now, it has been remarked that the early kinds of wheats must be sown thickly, because they do not tiller well, and should be sown rather late, because the flowerings would otherwise be liable to be caught by the late night frosts. The question therefore arises, would it be advantageous to sow early-maturing wheats first, instead of last, feed the growth well down with sheep, and thus cause free tillering, and also delay the maturity or ripening of the crop?

Farmers, as a rule, will be more prosperous when they keep more really good stock on their land and maintain a better system of cultivation and tillage. It does not pay to impoverish the soil or to reduce its "mechanical condition." When the soil gets caked like bricks at a depth of 4in. to 8in. below the surface the roots cannot penetrate, consequently the plants cannot thrive and produce prolific crops. The better the class of stock selected for the special requirements of the farmer, the more probability is there of profit. The greater the variety of marketable articles produced, and the more regularly and constantly the work on the farm is distributed, the less loss will there be from idle time.

The Poland-China pig is the result of judicious crossing during twenty-eight years of the Poland, the large spotted China, the Byfield, and the Irish pigs. The Poland-China, or "Magie" pig should be spotted black and white, with very coarse hair. They have never been known to have mange; they grow rapidly and fatten quickly, and have been known to attain a weight of 325lbs. in nine months. By feeding well for eighteen months to twenty months they can be got up to 600lbs., and finally to 900lbs. They will thrive on grass alone, and do better on grass than any other pig. They are very quiet if not interfered with too much, are good breeders and good mothers. They have splendid heavy shoulders, and carry more good meat than any other breed. The improved Berkshire comes next on the list for thriftiness and profitability.

Our climate has undoubtedly seriously altered for the worse. The heat is greater at times in summer; the cold more severe occasionally in winter than in the early days of settlement. The rain falls less often, but comes in heavier showers, so that the water rushes over the surface instead of soaking into the soil. Dew is less frequent and abundant in summer, and thunderstorms very seldom occur, whilst in early days they were frequent. Our fruit crops ripen much later now, and our "February" show has now to be holden in March. These troubles or disasters have been occasioned by reckless destruction of forests all over Australia—and especially in South Australia, where the axe, scrub-roller, stump-jumper, and firestick have reduced the pitiful half-acre of scrub and forest which stood to the name of each colonist in 1875 (as per Surveyor-General's report) to nearly vanishing point per head in 1901.

Why are the "approaching low pressures" from which "general rains may be expected" so often driven south? Because of the extensive high pressures in the interior of Australia. But what causes the high pressure there? The excessive radiation of heat from the parched plains produces an enormous area of highly-expanded dry air, which sucks up the moisture from the advancing low pressure, besides blocking its progress to the interior. Could this be prevented? Yes, at very great trouble and expense in planting large areas with forest trees, and assisting in the natural re-afforestation of previously timbered land. It is of little use planting single rows of trees around farms and other holdings—there must be five or six rows in all such cases, and hundreds of acres in blocks in very many parts.

When people plant trees or shrubs to serve as windbreaks for protection of orchards or vegetable gardens they must be careful to put the sheltering belt at a distance of not less than 100ft. from their orchard or garden. The large trees and shrubs require room for their roots, and if the fruit trees or vegetables have to compete with the windbreak for possession of the soil, it is most likely that the windbreak will have the supremacy. Large strong plants used for windbreaks would be more useful at 200ft. or 300ft. distance than at 100ft. When plants of any kind are crowded they must become spindled and sickly.

The caterpillars of codlin moth, now hidden in cracks and corners of the fruit store, or under old bark on trees, or elsewhere, are now changing into chrysalids. About the time the apple and pear blossoms drop their leaves the chrysalids will turn into codlin moths, which will fly about in the evening and drop one egg on each apple or pear. That egg, in a few days, will hatch a minute caterpillar, no thicker than a fine hair, and one-eighth of an inch long. The caterpillar will stroll around the fruit for a short time, and will then eat its way into the fruit, unless it has been sprayed with some arsenical compound, say arsenate of lime, or Paris green, or London purple, with lime. The most minute particle of the poison will then kill the little caterpillar; but if it once gets inside the fruit, no kind or quantity of poison can hurt it. In time the caterpillar will mature and soon become a moth, which will start laying eggs on other apples. The second brood does most mischief, the first does a lot. Spray and bandage will save most of the fruit.

AGRICULTURAL EXPERIMENT WORK.

BY W. L. SUMMERS, INSPECTOR OF FERTILISERS.

Since the Agricultural Bureau was first established many thousands of packets of seeds of new and valuable plants have been distributed for trial. With the exception of various cereals, these in very many cases have not been fairly tried or tested. Too often the seeds never receive any attention after being sown; sometimes, particularly if received a little early, they are not sown at all; at other times no trouble is taken to keep the names, to report results, or to save and distribute seeds of varieties that have proved of value. Many of these failures are probably due to the fact that just when attention is required the would-be experimenter is too busy with other work. There have been, of course, many favorable exceptions, but, taken as a whole, the distribution of seeds by the Bureau has not been altogether a success. Although we must always expect with new importations a large proportion of failures, the successes attained have been altogether insignificant.

With the Bureau organisation there is no question that much experimental work of great value could be carried on at little expense to the State. On our roll we have many of the most successful farmers, orchardists, vignerons, and gardeners in the State. With their valued experience at our command there is no reason why the operations of the Bureau should not be made vastly more beneficial. At present we seem to be nearly at a standstill—resting, as it were, on the past. In Canada they have a Co-operative Experiment Union, branches covering farming, horticulture, &c. There the department provides funds with which to purchase manures, seeds, new fruits, &c. Definite schemes of experiments are drawn up every year, and farmers and others are invited to help in the work. In 1899, 3,485 different persons were supplied with necessary materials for experiments, there being over 12,000 tests carried out; but, as usual, only a small proportion furnished reports sufficiently accurate to be of any value to other cultivators. The seeds supplied are usually grown at the Guelph Agricultural College, having first been proved to be of value. The results from this work have been distinctly profitable, and very many of those who have taken part in the work admit they have benefited financially. With the co-operation of the Roseworthy Agricultural College, and a little help from the Government, there seems to be no reason why the Bureau should not undertake similar work on a smaller scale, selecting its experimenters. The outlay, which would not be great, would be repaid manifold. It is not intended to infer that experiments conducted in the past by members of the Bureau have not been beneficial. On the contrary, the numerous experiments with fertilisers for cereals, fungicides and insecticides for orchard pests, &c., have been of very great value, but there is no doubt much more remains to be done. In this connection a few points might be mentioned.

Manures for Cereals.—Professor Lowrie has invariably had most profitable results on wheat when 2cwts. per acre of super. has been applied, while most farmers insist that it is unsafe to use such heavy dressings, and 60lbs. to 70lbs. per acre is the average used. Would not a series of carefully conducted experiments in different districts elicit information of ten times the value of the manures, &c., used. Then, in the cooler districts, with hay crops particularly, a top dressing of readily soluble manure, especially nitrogenous, would often largely increase the crop. Then the sowing of mixtures of cereals and legumes for hay pays in other parts both directly and indirectly; why not here in our cooler districts? These and similar tests on a regular scheme of experiments would most assuredly be worth the small outlay involved.

Manuring of Orchards.—This most important subject is almost entirely neglected by our orchardists. It would be of great benefit to the producers

and the State generally to demonstrate that the application of commercial fertilisers is as profitable here as elsewhere. The same would also apply to vines, though far more has already been attempted than with orchards.

Root Crops.—Will anyone say that root crops have received the attention warranted, or that where they are grown they are grown to best advantage? The manuring of root crops is much neglected, yet we know that most varieties respond very readily to generous feeding. Then there is large scope for work with potatoes, both in regard to fertilisers, varieties, and quality.

Market Garden Crops.—In the manuring of these crops we have a subject fraught with immense possibilities, but one that is greatly neglected. All growers find it absolutely necessary to use manures, but there is comparatively little experimental work to determine whether the most profitable fertilisers are being applied and in an economic way. Is the stable manure and litter obtained from the cities worth the cost and labor it usually represents by the time it is in the ground? Is it possible that green crops dug or ploughed under would give better results at less cost?

Pastures.—Here also there is room for considerable experimental work. So far as this State is concerned, we can safely say that little has been done in the matter of manuring of pastures, and that little has received scant publicity. Then there is the question of improving our pasture by means of introduced grasses and forage plants. The Bureau has from time to time introduced plants from countries with similar climatic conditions, but they have not had a fair test. Many hardy grasses that should have proved useful have been distributed, but the results are nil. Then our indigenous grasses and fodder bushes are almost entirely neglected, yet there is no reason why they should not improve under cultivation, and pay well for the attention bestowed upon them.

Alkaline Soils.—Experimental work on alkaline soils to demonstrate—as has been so profitably done in California—the treatment necessary to enable crops to be grown, and to ascertain what crops will grow on such soil, has been very greatly neglected in South Australia, though we have thousands of acres of such land on which nothing of value is produced.

Many other subjects of similar nature—such as the use of lime, quantity of seed to sow for various crops, tests of varieties of cereals, fruit trees, methods of cultivation, &c.—might be touched on, showing the immense field for useful work. It is not suggested that all these could be taken up at once, or that individual experiments dealing with most of them have not already been undertaken. These experiments would naturally divide into series applicable to various districts, according to soil and climatic conditions. A start might, however, be made at little expense. It would be necessary to have all plots of sufficient size to obtain accurate results, and to justify the extra labor involved in sowing, cultivating, and harvesting each separately. With cereals and manuring of pastures the plots would need to be of fair size—up to two acres each. With root crops, vegetables, &c., from a rod or two up to a square chain and so on, according to nature of the experiment.

The question naturally arises, how is this work to be carried out? The answer is, by obtaining monetary assistance from the Department, to draw up a proper scheme of experiments and instruction, and by securing reliable cultivators from amongst our members to do the actual work under supervision. There is no doubt whatever that we could readily secure the services of more than enough experimenters if the Department will assist. With, say, £150 to start with, ten or twelve series of manure tests for cereals and pastures could be carried out. This amount would purchase 30 tons of manure and leave £20 to £25 for seeds, carriage, &c. The experimenters would retain the crops to repay extra labor and time involved. An additional £50 would permit a number of other tests on the lines indicated being carried out.

In proof of the statement that we can readily secure men to conduct experiments, reference may be made to some experiments which have been carried out of late at practically no expense to the Department. In consequence of the publication of an article in August, 1898, issue of the *Journal of Agriculture* on results obtained in other parts in the manuring of potatoes, I was asked to arrange for some extended experiments, the fertilisers required being offered free of charge by the manufacturers and importers. As a result Messrs. Wright Bros., M. Jacobs, and H. McKinley, of Mount Compass Branch, put in five or six plots each, the area of each plot being 1 square chain. Great interest was manifested in these experiments, but the unfavorable season caused the results to vary to such an extent as to militate to a large extent against their value, though some valuable lessons were learnt. Isolated experiments on similar lines were conducted in other parts, some being very satisfactory. At present the following members of different Branches are conducting experiments with cereals and manures on a fairly extended scale under my directions:—Messrs. J. Brown, of Port Elliot; T. W. R. Hiscock, of Meningie; F. W. Roediger, of Gawler River; Jno. Crawford, of Normanville; D. P. Thomas, of Scales Bay; W. Towill, of Purnong; L. F. Christie, of Morphett Vale; J. C. Ruwoldt, of Mount Gambier; A. L. McEwin, of Brinkworth; A. F. Noll, of Quorn; W. Lange, of Melrose; C. E. Birks, of Wandearah; J. Schuppan, of Wilmington; and J. W. Vigar, of Rhine Villa. In each case plots are of one acre in area. One plot received $\frac{3}{4}$ cwt. of Thomas phosphate one to two months before seeding; others received $\frac{3}{4}$ cwt. Thomas phosphate, $\frac{3}{4}$ cwt. mineral super., $1\frac{1}{4}$ cwts. mineral super., and $1\frac{1}{4}$ cwts. Thomas phosphate respectively when the seed was sown. In nearly every instance unmanured wheat or wheat receiving less than $\frac{3}{4}$ cwt. of manure per acre is being tried alongside. Some have also tried other fertilisers, and also different methods of applying the fertilisers, so that valuable results may be expected. This means that over seventy plots each of one acre are being carried out in this series of tests. The manures (Star Thomas phosphate and Sheep Brand mineral super.) were presented to each farmer, and the carriage also paid, by Mr. F. H. Snow, the Adelaide representative of the manufacturers, so that except a few shillings for postage these experiments are costing the State nothing. Mr. S. McIntosh, the Village Settlements Expert, has also undertaken several experiments with fertilisers presented by the manager of the Adelaide Chemical Works Company.

In addition to these experiments, during the past few years a large number of public school teachers have been supplied with seeds of various sorts; also fertilisers for their agronomy plots, the object being to obtain useful information, while at the same time instructing the pupils. Plots have varied from a few square yards to several chains. Last year over thirty schools—from Wilson in the North to Mount Gambier in the South—and this year about twenty-five teachers are engaged in carrying out similar work. Unfortunately, however, too many teachers entirely overlook the fact that they undertake when obtaining seeds and manures to report on results. In many cases the teachers report that the sparrows and other pests, unsuitable conditions, want of time, &c., have prevented records of returns from the plots being furnished, though much interest is manifested in the operations by the boys. This alone is worth some trouble to secure, as the work will not then end with the school plots. Seeds and manures for the school teachers have been paid for out of a vote of £10 allotted by the Hon. Minister for the purpose.

It will thus be seen that the matter has not been entirely neglected. The experiments in the past have, however, been conducted with too little system and uniformity; hence the necessity for some alteration.

The operations of the Ontario Agricultural Experiment Unions were reviewed in the August, 1900, issue of *Journal of Agriculture*.

THE ROOT DEVELOPMENT OF PLANTS.

Owing to the fact that being all underground, and presenting many almost insuperable difficulties in studying, we know comparatively little about the root development of plants; yet all cultivators know that without conditions favorable to the development of the roots we cannot get a full crop of any description. For several years past this matter has been one of careful and patient research on the part of the staffs of various agricultural experiment stations in America. Comparatively recently, at the Dakota Experiment Station, a means of overcoming one of the chief difficulties in examining the root growth has been devised by Professor Eyck, and some extremely interesting and valuable information has been obtained thereby. It has been known that the soil within a fair radius of, we will say, a maize plant does not at any time contain one-twentieth of the water required in the production of an average crop, and that it was only by enormous root development that the plant could gather sufficient moisture to ensure growth above ground between the showers of rain. No system is likely to be found by which the full development of the roots can be shown, as the growing or feeding tips are so slender and fragile that it is impossible to separate them from the soil. The system adopted at Dakota has, however, been exceedingly satisfactory, and has taught several important lessons. In well-prepared soil it was found that the roots of maize plants penetrated to a depth of 1 ft. in thirty days, 2½ ft. in fifty-five days, and 3½ ft. at eighty-five days. Wheat plants when matured sent their roots to a depth of 4 ft., and oats had more growth below surface than above. Where the plants were too close together the evil results both above and below ground were plainly demonstrated. It was also noticed that the roots of maize, especially while the soil was moist, showed a decided inclination to develop near the surface, while with wheat and oats the roots went down almost vertically, sending out numerous small feeders, which practically occupy the whole soil to a depth of nearly 4 ft. and then struggle a foot or more deeper. Both with wheat and oats it was invariably found that in the region just below the depth the plough penetrated few feeders were thrown out. Until forced by drought to descend deeper for moisture the roots of maize also avoided this region of what is often termed "hard pan." Breaking up this hard pan by subsoiling was found essential to the full development of the roots. It was also found that different varieties of wheat varied in the power of their roots to penetrate the soil. Some were found that would penetrate 5 ft. or more, and others that seemed too weak to penetrate heavy soils at all. These investigations also showed how the soil is affected by the roots of the crops grown. When fresh prairie land is brought into cultivation the soil is mellow, moist, and rich. A few years of continuous cultivation produces physical change of a harmful nature. The soil became finer, more compact, dries out quicker, and bakes harder. There is a consequent insufficiency of air in the soil; the young roots cannot penetrate and feed in it properly. When wet it becomes sticky, and when dry dusty under cultivation, and is readily blown away. When the land is first broken up the surface soil for several feet is simply interlaced with roots of grass and other herbage. After continuous cultivation it became deficient in roots of the right kind, *i.e.*, stout, hardy, deep-reaching roots; hence the result. The necessity for change of crops, resting the land, and growing deep-rooted plants to restore fertility to the soil is obvious. The roots absorb and store up plant food, bring up food from the lower layers of soil, and add humus to the soil as they decay; while in addition the plants generally obtain from the air certain constituents that, when added to the soil, supply the necessities of future crops. With the various pea-flowering plants (legumes) there is a considerable addition of nitrogen obtained from the air, and the result to the succeeding crop is marked, as most farmers know from personal experience.

INSTRUCTION FOR MILK AND CREAM SUPPLIERS.

BY G. S. THOMSON, N.D.D., GOVERNMENT DAIRY INSTRUCTOR.

Our butter export season is about to be opened, which, although late, may turn out better than we anticipate. In dealing with the produce it is to be desired that the improvement which was manifested throughout the past year's shipments will be repeated, and that our reputation as a butter-producing State will be further improved. The practice of submitting reports to factories and shippers will be continued on the same educational lines as conducted in past years. It is very gratifying to be able to state that splendid results were obtained by this means of instruction; and without the system consignments of butter with faults in flavor, texture, color, salting, and packing would have passed through the depôt unobserved, and the arrival of dirty and damaged boxes would not have received the attention that was otherwise given. The Government depôt may be recognised by the dairying industry of South Australia as an educational institute, and again I will request factory managers and buttermakers to respond with alacrity to the instructions issued from the department. But this opens up the question of where the most-needed improvement is to take place—in the factory or on the farm. The factory manager can certainly prevent errors in texture, coloring, salting, or packing, but he cannot rectify the damaged flavor in his butter. To a very great extent the farmer is responsible for the success of factory employes; they are at his mercy, and the quality and price of butter and cheese principally depends on the care and cleanliness of the milk suppliers. We must openly confess that the dairy farmer has not yet realised the importance of his part of the work in building up a prosperous industry. There is reason to regret that many are unwilling and some emphatically refuse to be taught anything concerning their duties, believing that the knowledge they possess excels that of the factory manager, who is in the best position to point out mistakes and suggest remedies. Let the dairy farmer submit to the teachings of common sense. We are followers of an occupation that demands much care and system in the manipulation of our produce, and it is too true that the average dairyman is averse or forgetful to regularly practice habits of cleanliness in the discharge of his work. There is no exaggeration in this statement, as from day to day we have before us evidence of the deplorably neglected state of some farmer, and the treatment to which the milk and cream is submitted. If suppliers would think for one moment on the ravages of microbe life, and the thousands of pounds that South Australia loses annually through uncleanness, the managers would witness fewer unpleasant sights in cans of milk and cream received at the factories. Surely it is time for the dairyman to amend his ways, and accept the teachings in this article, which are written from observation and are essentially practical. We do not desire the farmer to study science like a scientist, but we reasonably expect every man to practice what costs him little trouble and expense, and which will strengthen our industry and bring credit and prosperity to the State. Continual neglect in dairying circles would speedily bring ruin to the wealthy man, and in our midst we have illustrations of the prosperous farmer who is systematic in his labors, and, above all things, who demonstrates that cleanliness is the first step to success. We covet such exemplary farmers, who prove to others what we are daily teaching. Again, the dairyman who is neglectful in what he calls trifles is sometimes careful in other matters pertaining to his farm. We sometimes find on the farm modern dairy buildings; but, on the

other hand, the cows are poorly fed, there is no system in conducting work, cleanliness is practically ignored, and the farmer grumbles at the factory, and cannot understand why his milk and cream should give the manager cause for grumble. Permit me to ask the question, "Is it possible for the factory manager, although favored with up-to-date machinery and a fine building, to manufacture a good article from tainted milk?" Would it be possible for a builder to erect a long-standing and profitable house on a foundation that is condemned? The foundation of successful butter and cheese making is to be found in the purity and cleanliness of the milk and cream, and it matters not how competent and skilled the maker is and how perfect the factory may be, he will never turn out produce of a creditable quality where the raw material is contaminated.

In writing this article I will take opportunity to show how dairying is usually done, afterwards how it ought to be done, and it is my earnest wish that the suggestions given will be universally adopted. I might mention that before this paper was written the opinions from eighteen factory managers were received on the subject of the better treatment of milk and cream.

How Dairying is Usually Done.

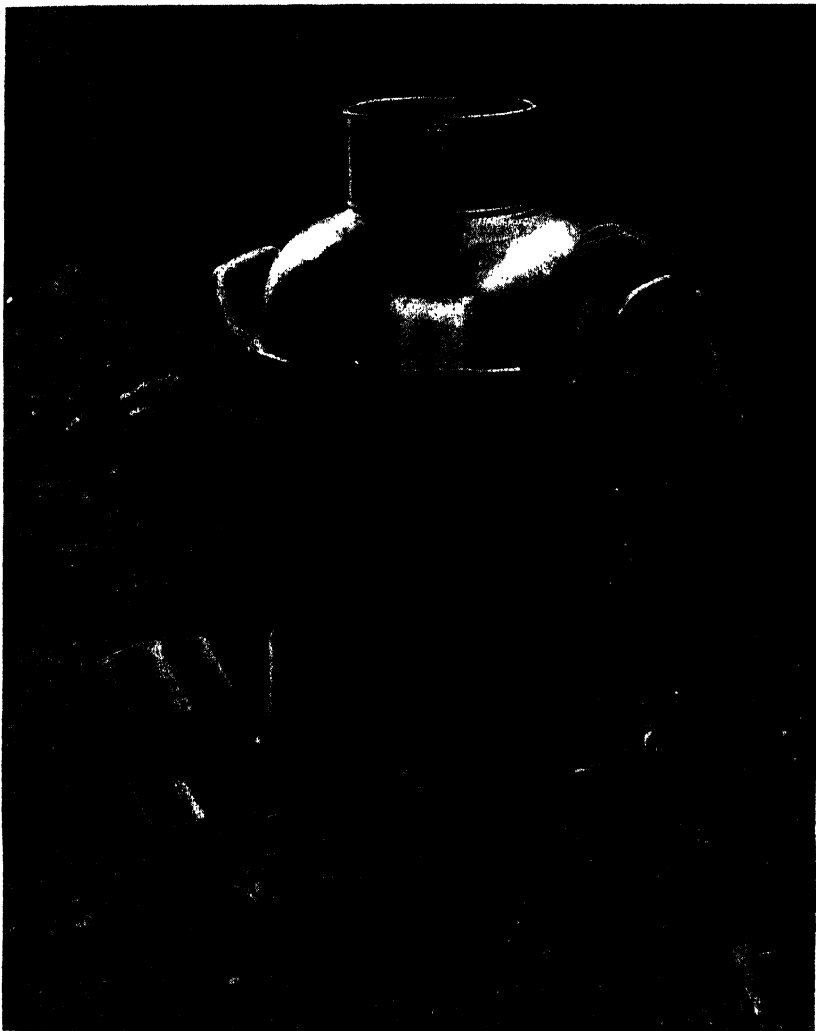
What we generally see on the dairy farm is a rough and tumble-down milking bail and imperfect sanitary conditions. There is usually to be found within close proximity to the milking bail an accumulation of manure, and where the cows are milked mud and refuse abounds.

In the accompanying illustration the imperfection of the milking shed is a striking feature, and here I wish to draw attention to the undesirable place that is occupied by the milk and cream cans. Consider how cans of milk unprotected from the admittance of insects, mice, dust, and in the vicinity of smells can possibly escape contamination and taint. Is it reasonable to expect that these raw products can remain through the night in warm weather without the flavor being injured? Still it is a common practice, and it is not unusual to find cats and dogs satisfying their thirst from these milk vessels.

Milking.—Milking is done at irregular hours and by incompetent and careless people who neglect to wash the teats of the cow and clean the udder and flanks. The milker's hands are not as clean as is necessary, clothes are entirely unsuitable, and the vessels used for milking are cans of imperfect manufacture. With this combination of neglect and carelessness the milk supply cannot be free from a heavy sediment of dirt, and in summer weather acidity speedily develops, to be afterwards followed by taint.

Storage of Milk and Cartage to the Factory.—I have already pointed out the customary practice of leaving the milk in unprotected cans in the open air overnight and in insanitary places. Now I wish to say that very seldom is freshly-drawn milk aerated or cooled. It is poured into the factory cans as it comes from the cows, the animal heat is locked up, gases develop, the cans are without dirt covers in summer, and in this state they are carted to the factory. Not alone is this done, but morning and evening milk are mixed together, and the partially-fermented supply is made to injure the sweet and better-flavored morning's product. When milk treated as above reaches the factory, it is the duty of the manager to point out defects, and there is no surprise at his delivery of stormy language when he removes several varieties of insects and foreign matter from the surface milk in the cans, and well does the manager know that mixed and neglected milk supplies will not yield the same quantity of cream and good butter as the supply from farms where intelligence and care have been displayed in the treatment of the product.

Care of Cans.—The uncleanly condition of supplier's cream cans is responsible for bad flavors in butter, and in cheese factories whey-tainted milk is of common occurrence, and is disastrous to the manufacture of a payable article. I have had experience of whey-tainted milk in the making of cheese in different districts throughout South Australia, and I agree with factory managers that



INSANITARY CONDITIONS OF MILKING SHED.

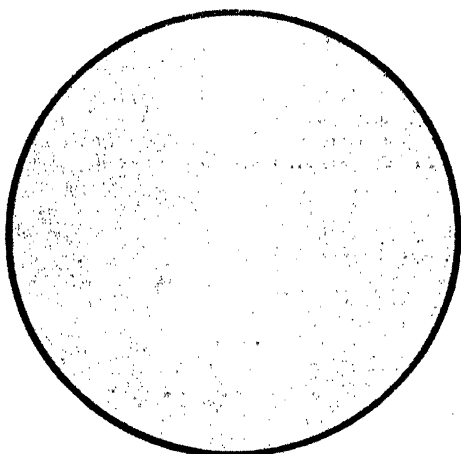
the prevailing custom of taking back factory by-products in the milk cans and insufficient cleansing of the vessels are the causes of so many rusty and utterly unsuitable cans being in use and which are ruinous to the quality of butter and cheese.

To retain sweetness in milk I have advocated the covering of milk and cream

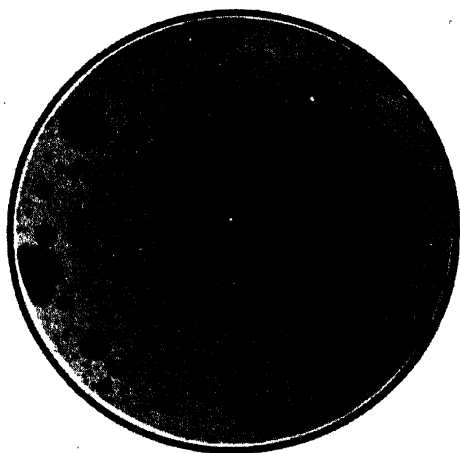
cans with a calico envelope kept well saturated with water, but, unfortunately, few have followed the suggestion. In hot summer weather the gain from this simple device is wonderful, and experiments have been conducted to show that milk can be kept overnight and carted a considerable distance to the factory in a perfectly sound condition. Where cream is sent to the factory the washing and scalding of the cans is a matter of little concern with some people, and many times I have scraped from the inside seams of vessels putrid cream which must have contaminated and spoiled many pounds of butter.

Hand Separators.—The hand separator is a useful machine in dairying circles, but to-day we find it exercises a good and bad influence on the quality of butter. The separator in its right place and in the hands of careful manipulators is a stimulus to the industry, while, on the other hand, we deplore its existence, and have reason to denounce its sale. How many separators there are working to-day on farms situated within a few miles of a factory, and where but a small number of cows are kept. There are many, and we find the owners of these separators very often at variance with the factory in sending their cream to the city or to another factory miles distant. The quality of cream from numerous collections on small farms is usually unfit to the manufacture of good butter. In many instances cream leaves the farm in one can of eight to twelve collections. What condition of ripeness can this product be in? What quality of butter can be manufactured from a mixture of different degrees of acidity, and when cream of this condition and age travels in hot weather to distant factories? What loss in butterfat can it represent? In answer to these questions there will be found good grounds for complaint in the handling and treatment of cream, and instead of suppliers rushing all over the country to patronise factories, let them support the industry of their own district. There is great cause, however, for the factories in this State taking action to stop this increasing and disastrous practice. Coupled with these evils we have to combat want of attention in the handling of separators. There are competent and trustworthy owners who treat their machines with skill and care, whilst others are regardless of all responsibilities, working the separator twice daily and cleaning it but once. Can it be true that some farm hands are so neglectful of the necessity of cleansing the bowl and its accessories that they find a way of escape in running warm water through the machine after separation, and this suffices until the next operation comes. It cannot be denied that many separators are kept in filthy places, and cream is stored in any sort of outhouse and in the presence of searching odors. How can it be otherwise than that our industry is kept down when such a state of affairs is common? And until suppliers take steps to improve we will never place ourselves in a satisfactory position.

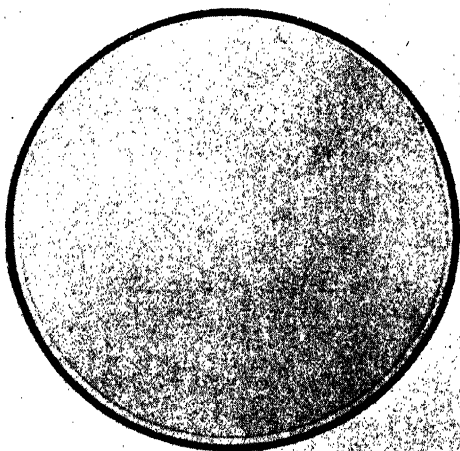
Preservatives.—The use of powders sold for preserving dairy produce has become of very common occurrence. Of the compounds in the market some have marked preserving properties, and are useful when employed in extreme cases; but it is well established that preservatives are added to milk and cream when a reasonable cause is wanting. Suppliers are not aware of the injurious effects these so-called "harmless" salts and liquids exert on the value of milk for butter and cheese making, and in the case of preserved cream the butter manufactured never possesses the characteristics of the article made from a well-ripened product. To show how preservatives are used indiscriminately, I have had analysed a sample of milk taken from a vat immediately before renneting, and found it to contain an exceedingly high percentage of boracic acid. The cheese made from the milk could not possibly be of good quality, proving that the practice is ruinous to the manufacturer. If suppliers carry out the recommendations given in this pamphlet, there will be little need for incurring the expense of preservatives, and the quality of our butter and cheese will be further improved.



No. 1.—Appearance of plate with germ food ready for the experiment.

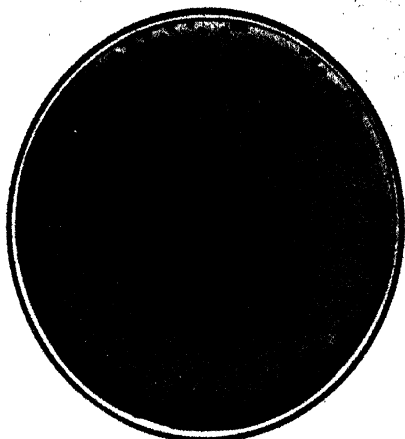


No. 2.—After gently brushing the udder of a cow Plate 1 was exposed for 20 secs. The colonies of germs developed in two days, thus illustrating the number of acid and taint producing organisms that fall into the milk pail when proper precautions are not adopted before milking.

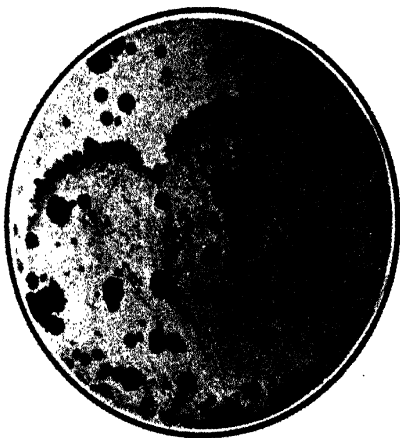


No. 3.—After dusting and damping the udder of the same cow Plate 3 was exposed for 60 secs. Four colonies are visible, proving the great necessity for universally following the practice.

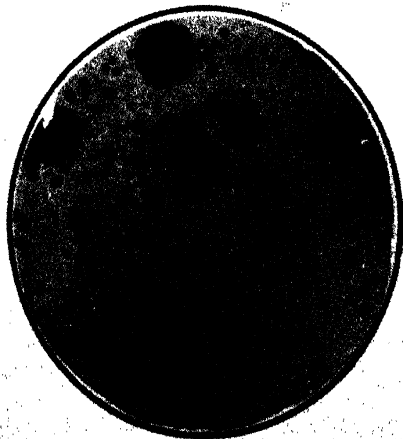
No. 4.—From one drop of milk that was taken from the yield of a cow a few minutes after milking. No attempt was made in this case to have the udder and teats of the cows clean, and the milker was regardless of general cleanliness.



No. 5.—Showing what grew on a hitherto spotless plate after it was exposed in a dirty and dusty milk-room for 10 min.



No. 6.—Colonies and mould from one drop of milk taken from one can supply received at factory.



Illustrations of the Danger of Dirt in Bringing About Contamination of Milk.

The following illustrations, which represent how bacteria are introduced into the milk supply, should be convincing evidence of the great need for care by all who are engaged in dairy-farming. In reviewing the six plates I might remind readers that before the exposure of Nos. 2 and 3 under the udder of the cows and the inoculation of 4 and 5 with one drop of milk they presented the same appearance as Plate 1. In the preparation of these cultures a thin jelly-like substance is first liquefied and poured into each glass plate. This is known as the germ food, and on this culture media the particles of dirt and adherent organisms from the udder of the cow give place to the colonies. In the development of Nos. 4 and 6, one drop of milk was shaken with the liquefied jelly and afterwards poured into the plate. In looking over these reproductions consider for a moment what myriads of destructive germ life must find a way into milk and cream before it leaves the farm, and when this point is made clear to suppliers it will be admitted that there is cause for plain speaking.

Tests for Farmers and Factory Managers.

If suppliers are at all sceptical to what is taught about germ life in producing taint in dairy produce, let the following simple experiment be conducted:—Select a cow and milk her, and treat the milk as near as possible to the instructions given in this article. Keep the milk in a clean dairy and cover the vessel with damp muslin, and note the time the milk takes to develop acidity or lose its flavor. Milk the same cow a few days afterwards without adopting precautions; do not cool or aerate the milk, and store it in a closed or open vessel in the dairy. Compare results, but in doing so take into consideration temperature of room and conditions of weather. Just as I advocate farmers conducting experiments to prove the value of proper methods, factory managers might assist by offering to test the keeping qualities of the milk. For example, when a supplier endeavors to follow the course of instruction given, let the factory manager take the acidity and temperature of his milk supply. The result could be compared with duplicate cans from day to day until the supplier was assured of the benefits of careful milking, aeration and cooling, storing, and covering cans.

How Dairying Should be Done.

On the following page we illustrate two good types of milking sheds. The first shows a large herd of cows in the bails and ready for milking. A feature of the shed is the practical construction, being entirely free from anything of an elaborate or costly description. It will be observed that the cows are under one roof, and not, as we very often find, in scattered and dilapidated outhouses, which makes milking an unpleasant and inconvenient duty.

The second picture shows a three-cow bail erected at a small cost, and, above all, it is built so that cleanliness will be the most striking attraction. The space allotted to each cow is abundant, and the floor is soundly bricked and the drainage good. No matter how wet the weather is, there is no possibility of the animals standing in inches of mud and the milkers exposed to the elements. At this small dairy farm the rules of milking are rigidly enforced, the cows' udders are pictures of cleanliness, and in the illustration a person is seen engaged in brushing the flank and udder of a cow before milking begins.



WELL-APPOINTED MILKING SHED.

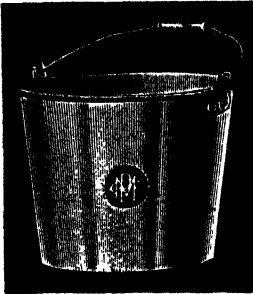
Milking.

When cows are in the bail a person of particular habits should precede the milkers and brush the udder and flanks of each cow, removing the dry particles of dust, scurf, and loose hair. The teats of each cow should now be washed and dried, but washing of the udder need not be done unless dirt is adherent to the



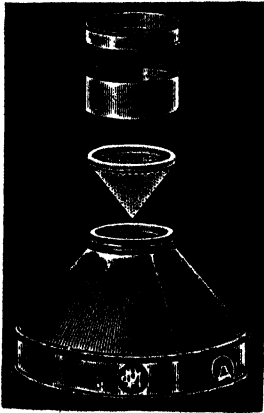
SMALL WELL-APPOINTED MILKING SHED.

hair and skin. A cloth wrung out of clean water is rubbed over the udder and flanks to arrest and remove dust that would otherwise fall into the milk pail, and a few drops of milk are removed from each teat into a vessel and given to the pigs.



"SEAMLESS"

In reviewing this simple and expeditious work every dairyman will readily conceive what good results must follow such a course. There is nothing advocated to entail more than a few minutes' time beyond what is customary in the milking of a herd. The water used for moistening the hands need not be boiled purposely, but can be obtained from a supply which is always at hand in every house. Concluding milking, the duty of the supplier is to have the milk aerated and cooled. The merits of the aerator are to expel the unpleasant odors that accompany freshly-drawn milk, and to introduce air and to lower the temperature, and extend the keeping quality of the milk. An aerator is very easily worked, and the price places it within the reach of every one.



MILK STRAINER.

Before aeration is begun, however, the milk is run through a sieve which is so constructed that it can be readily taken to pieces and easily and perfectly cleaned. The next illustration shows the Austral aerator at work in a can covered with a wet calico envelope, to maintain a cool temperature in the milk. Aeration should be done in the coolest place in the dairy, and away from the presence of smells. When the operation is concluded, place a wet muslin over each can and keep the envelope wet over night and until the milk reaches the factory. The use of muslin over the mouth of cans is preferable to closing down the lids or keeping the cans open; the former practice shuts in the odors, and the latter exposes the milk to insect life and floating particles of dust, &c. No difficulty should be found in adopting the suggested covers, as they are easily made and can be readily removed, washed, and scalded.

By the use of a more perfect apparatus, called the Lawrence or "Star" cooler, the temperature of the milk will be reduced almost to the temperature of the water in the barrel, and the brief exposure of the milk to the pure air of a cool dairy would greatly increase the good properties of the milk. In most dairy farms little difficulty would be experienced in getting a ready supply of cool water immediately before the cooler is used, and instead of a barrel being employed a small cistern might be constructed in the dairy with increased benefit.

Cleaning Milk and Cream Cans.

The cleansing of milk and cream cans cannot be too carefully done, both at the factories and on the farms, and I would strongly urge suppliers to give this part of their duties close attention. I would like to again mention the injurious practice of taking back whey in the same cans as used to convey milk to the factory. Fresh cans should be employed for this purpose, and when separator milk is carted from factories the cans require a thorough washing with slightly warm water, and a repeated scalding after the milk has been removed.

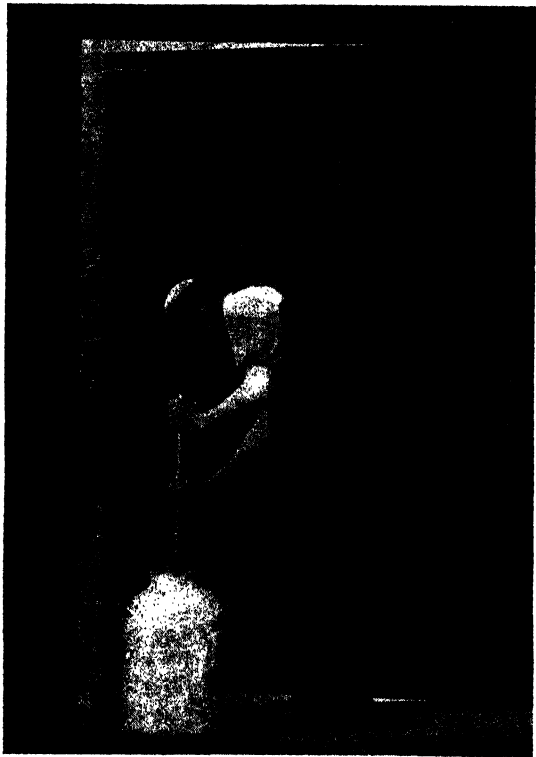
The Separator and Separation of Milk.

Before working a separator it should be fitted securely on a sound foundation and in a room free from the possibilities of smells and impervious to dust and water. In separating milk the operator should be satisfied that the bearings are well oiled, and that full speed is gradually attained before warm water is run into the bowl. When this is done the milk may be admitted, and the separator steadily worked until the supply is all through, when a small quantity of separator milk is added to remove the cream left in the bowl of the machine. The separator is now taken to pieces, and each part is thoroughly cleaned and scalded with boiling water and soda. The slime that is removed from the bowl should be destroyed, and not given to pigs or fowls. The separator should be put together again immediately before use, and on no account must the cream screw be altered unless a suitable reason is found.

***Milk and Cream.*—**

Milk is in the best condition for perfect separation immediately after it is taken from the cow.

In cold weather it may be kept over night and heated up in the morning and separated alone; but only when small quantities are dealt with should this be done. I would recommend suppliers to separate morning and afternoon, and collect the cream in two lots, to be sent to the factory twice a week. Strict attention must be given to stirring the mixed creams at separation, and the consistency and ripeness of the product carefully studied; but suppliers should endeavor to entrust the ripening to the care of the factory manager, who can best judge when the cream is ready for churning.

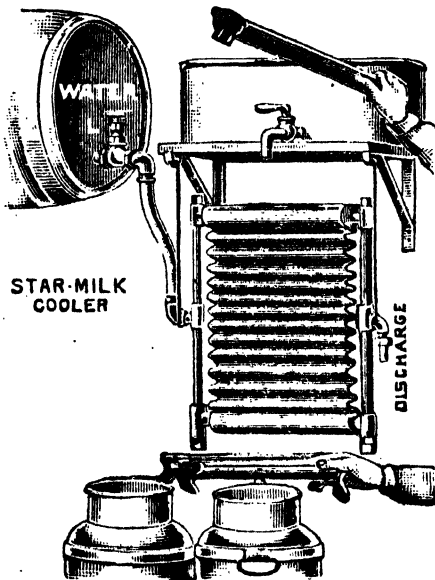


AUSTRAL AERATOR.

Colostrum and Preservatives.—Keep out the “beastings” from the milk supply until five days have elapsed of calving and until the “cowy” smell has disappeared. “Cowy” milk is ruinous to cheese-making and is very objectionable to butter, reducing its keeping qualities and price. Preservatives must not be added to milk; there is no necessity for indulging in the practice. Cleanliness is a more profitable course to pursue, and one that is assuredly in keeping on every farm. Let it be again repeated that dirt is the carrier of germ life, and it is known to us that the latter causes the numerous taints found in our dairy produce. The preserving compound which we add in reckless quantities and at considerable cost has a duty to stop the action of the germs that we admit by lacking to enforce the laws of cleanliness, and although the weakness is screened damage is done to the quality of the manufactured butter.

Factories and Grading of Cream.

It has been suggested to grade cream as it arrives at the factory, and if this were done farmers would find it necessary to adopt precautions to maintain a



STAR, OR LAWRENCE, COOLER.

good quality; otherwise accept a lower price for their supply. At one factory in the State the butter made from second-rate cream is sold at a reduced price, and the supplier is paid accordingly. This, I am told, has been met with good and encouraging results. But can the same be done at the present time in a district where many factories exist? No; these factories are at fault in accepting inferior cream with a view to encourage suppliers to patronise their establishments. I have more than once pointed out the dangers of this ruinous rivalry in districts where tainted milk is grasped, and at the same time the directors of these factories groan at the bad quality of the produce manufactured. Repeatedly I have suggested the purchase of milk according to the acidity contained, and now that the majority of factories are in possession of the necessary apparatus there is no

need for the acceptance of milk that contains an excessive percentage of acid. It is to be hoped that directors will awaken to this much-needed change in the working of their factories.

Some Rules for the Dairy Farmer.

1. Cleanliness is next to Godliness.
2. Remember that the microbes of dirt are the cause of so many taints in the produce of the dairy.
3. Have your milking shed built on suitable ground, and have the floor bricked or laid with stone.

4. Milk the cows according to the following rules, which should be enforced in every dairy farm :—

- (a) Have the cows milked in a clean and sanitary place.
- (b) The milker must be clean in person.
- (c) Brush the udder and flanks of the cow.
- (d) Wash the teats and dry them.
- (e) Damp the udder and flanks of the cow with a cloth.
- (f) Moisten the hands at intervals of milking with clean water.
- (g) Wash the hands after milking each cow.

5. Never attempt to use a milk vessel until it has been thoroughly washed and scalded with boiling water.

6. Put your milk vessels to another purpose when affected with rust.

7. Remember that whey should never be put into milk cans, and that rust quickly follows the practice.

8. In summer keep the milk through the night in cans covered with wet calico, and place them in a cool place and away from the evil effects of smells and dust.

9. Aerate the milk or use a Lawrence cooler immediately after milking ; it will pay you handsomely for the little trouble and expense.

10. Send your milk and cream to your district factory, and do not be tempted to go further away without a just cause.

11. Note the comments and recommendations on the separator and how to work it ; be very particular about your cream collections and vessels.

12. Do not use preservatives indiscriminately.

13. Read over suggestions on farmers conducting tests for themselves.

14. Work harmoniously with the factory and accept instruction which is given for the benefit of farm, factory, and industry.

SKIM-MILK CALVES IN THE FEED LOT.

The following report was published by the Experiment Station, Manhattan, Kansas, on July 16, 1901 :—

Feeders find that the average skim-milk calf does not make profitable gains in the feed lot and will not buy him. Farmers find that the difference in price between an ordinary skim-milk calf and one that has run with the cow is frequently greater than profits made from milking, and they drop dairy work.

The Kansas Experiment Station during the past winter fattened 130 head of calves for baby beef. These were divided into nine lots—one lot of ten had been raised by hand with skim-milk, and another lot of ten had run with their dams in small pastures until weaning. Both lots were put in fattening yards at weaning, and were fed for seven months on alfalfa hay and corn. The results are as follows :—

	Average gain per head.	Feed for 100lbs. gain.	
		Corn.	Alfalfa.
Calves raised with dam	lbs. 435	475	472
Skim-milk calves	440	439	436

Corn cost 40 cents a bushel and alfalfa hay \$8 a ton, making the cost of each 100lbs. gain \$5.28 for calves raised with their dams, and \$4.88 for the skim-milk calves. The calves when fattened were shipped to Kansas City, the steers in each lot bringing \$5.40 per hundred, and the heifers \$5.15. The packers paid the same price for the fattened skim-milk calves that they did for the others. In this trial the skim-milk calves made the greatest gain, gains at the least cost, and made the most profit.

We attribute the good showing made by the skim-milk calves to the fact that at weaning time they were already on grain feed, they did not worry at loss of their dams as did the other calves, and they were perfectly tame.

The skim-milk calves were fed until weaning on sterilised skim-milk with a grain ration composed of equal parts of corn and Kafir corn, with all the alfalfa hay they would eat. They were fed in this way twenty-two weeks, and made an average daily gain of 1½ lbs. per calf. The feed to raise these calves to weaning cost \$5.27 per head. As the results show, they were in good condition for feeding when weaned, and the experiment shows strongly the good feeding qualities of the skim-milk calf, and the profits that can be made from it, when the calf is properly handled from birth to weaning, and then pushed for baby beef.

The College herd of scrub cows, bought without regard to their value for the dairy, produced in a year, at creamery prices, milk worth \$37.75 per cow. The skim-milk calves which were fattened in this experiment were of mixed breeding, and were selected without regard to their value for the production of baby beef. They brought an average of \$40 each when marketed at about a year old. This shows a gross income in a year from a scrub cow and a scrub calf of \$77.75, when both cow and calf are pushed, the cow's milk sold, and the calf raised on skim milk.

The best cow in the scrub herd produced milk in a year worth, at creamery prices, \$60.88. The best calf in the skim-milk lot brought \$47. This shows that a good scrub cow with a good calf could be made to bring over \$100 gross income in a year. With large grade Shorthorn or Hereford cows of the dairy type crossed with a short-legged, thick-meated, blocky bull, the returns from both cow and calf would undoubtedly be much greater, making the combination of dairying and baby beef very profitable.

SIZE OF COWS AND PRODUCT OF BUTTER.

Newspapers are publishing a statement with respect to a test of the butter-producing capacities of a herd of forty-five cows, but fail to say where the trial was conducted. The test is said to have lasted over a year, and it was found that the bigger the cow the less the quantity of butter produced as compared with her weight. Of course, the larger the cow the more food would she need to support her body; therefore the cost of her butter would be greater than that of a smaller cow, and in the course of, say, ten years her beef, if sold to a butcher, would have cost probably a good deal more than its worth in consequence of the great extra annual consumption of food. This would be extra costly if bran, pollard, crushed oats, meal, and copra cake were allowed, as is usual, to milch cows. In the test cows averaging 1,000 lbs. weight produced 24.4 lbs. annually for each 100 lbs. weight; cows averaging 900 lbs. to 1,000 lbs. produced 37.4 lbs. per 100 lbs. live weight; cows averaging 800 lbs. to 900 lbs. produced 39.4 lbs. per 100 lbs. live weight; and cows averaging 700 lbs. to 800 lbs. produced 41.7 lbs. per 100 lbs. live weight. Taking the cows at 1,000 lbs., 950 lbs., 850 lbs., and 750 lbs. each respectively, the average yield for each cow in the several divisions would be 24.4 lbs., 35.5 lbs., 33.9 lbs., and 31.2 lbs. for the year.

MAIZE FOR HORSES.—It is surprising to hear that the stud of some 3,000 horses, kept by the Glasgow Corporation, for the working of the tramways, and the management of which is so highly praised for the skill and care employed, has for upwards of four years received practically no oats. Oats are included in the rations prescribed for newly-acquired horses not yet properly seasoned for street work, but the standard ration is comprised of maize, beans, hay, straw, and during the four and a half years oats have been omitted the horses are said to have maintained their condition, while their efficiency has been at least equal to what it was when oats formed part of the standard food. The ration adjusted for the horses under process of training is as follows:—Oats, 5 lbs.; maize, 6 lbs.; beans, 2 lbs.; hay, 10 lbs.; straw, 2 lbs.; total, 25 lbs. per head per day.

SELECTION OF SEED GRAIN, AND RESULTS THEREFROM.

The twenty-sixth annual report of the Ontario Agricultural College, Canada, 1900, gives the results of selecting plump, medium plump, and shrivelled seeds for sowing, during a period seven years. The report is most valuable and interesting, and is appended in full:—

A large amount of very careful work has been done within the past eight years in order to determine the influence of different selections of seed upon the resulting crop. The reader's attention is directed to the results of these experiments, which are becoming more valuable from year to year, owing to the increasing length of time during which the experiments have been conducted. Fresh seed has been taken each year from the general grain crop, secured from the farm or the experimental department. It will, therefore, be understood that whatever difference there is from the influence in the selection of seed, that difference is due purely to the work of the one year. For the large plump seed, none but well-developed seeds were selected; for the small plump sample, the grain selected was of a uniform character; and for the shrunken sample, none but shrunken grains were used—the last selection being made regardless of the size of the kernels. An equal number of grains of each selection was used, the object being to ascertain the comparative producing powers of the seeds of the different selections.

Barley.—The experiments with the different selections of seed barley extend over a period of six years, the average results for the whole period being as follows:—Large plump seed, 53·8bush. of grain per acre, 1·5 tons of straw per acre, and 49·5lbs. of grain per measured bushel; small plump seed, 50·4bush. of grain per acre, 1·5 tons of straw per acre, and 48·8lbs. of grain per measured bushel; and shrunken seed, 46bush. of grain per acre, 1·4 tons of straw per acre, and 49·1lbs. of grain per measured bushel. From these results it will be seen that the large plump seed has given an average of nearly 8bush. per acre more than the shrunken seed, and a little over 3bush. per acre more than the small plump seed. In the results for 1900 the large plump seed gave 8·5bush. per acre more than the small plump seed.

Spring Wheat.—The experiment in seed selection with spring wheat has now been conducted for a period of eight years. The average results for the eight years show that large plump seed produced 21·7bush. of grain per acre, 1·4 tons of straw per acre, and grain which weighed 59·1lbs. per measured bushel; that the small plump seed produced 18bush. of grain per acre, 1·3 tons of straw per acre, and grain which weighed 58·3lbs. per measured bushel; and that shrunken seed produced 16·7bush. of grain per acre, 1·2 tons of straw per acre, and grain which weighed 56·9lbs. per measured bushel. The plump seed produced grain which was heavier than that produced from shrunken seed by a little over 2lbs. per measured bushel. The greatest difference in the average yield of grain per acre was between that produced from the large plump seed and that produced from the shrunken seed, the difference being 5bush. per acre in favor of the former. The large plump seed, therefore, gave practically 30 per cent. more grain per acre than that which was produced by the shrunken seed.

Oats.—Siberian oats is the variety which has been used in the experiment of seed selection for seven years in succession. The results of the experiment with oats are even more striking than either of the experiments with barley or spring wheat. In the average returns received for seven years, it is found that large plump seed produced 62bush. of grain per acre, 1·9 tons of straw per acre, and grain which weighed 33·2lbs. per measured bushel; that medium-sized seed produced 54·1 bush. of grain per acre, 1·8 tons of straw per acre, and grain which weighed 32·2lbs. per measured bushel; and that small seed produced 46·6bush. of grain per acre, 1·8 tons of straw per acre, and grain which weighed 31·8lbs. per measured bushel. The large oats, therefore, produced 16·4 bush. per acre more than that produced by the small seed. This shows an increased production of grain of fully 33 per cent. resulting from the large as compared with the small seed oats.

Peas.—For five years in succession an experiment has been conducted in the selection of peas. The summary results for the whole period show that large peas gave an average of 30·3 bush. of grain per acre, 1·3 tons of straw per acre, and grain which weighed 57·8lbs. per measured bushel; and the small seed produced 23·9bush. of grain per acre, 1·1 tons of straw per acre, and grain which weighed 57·6lbs. per measured bushel. It will be seen that there is but little difference in the weight of grain per measured bushel, whether grown from large or from small seed. The difference in yield of grain per acre, however, is quite marked, as the large seed produced 6·4bush. per acre more than the small seed, or an increase of about 27 per cent.

POULTRY NOTES.

BY D. F. LAURIE.

NOTE.—Letters of inquiry, &c., should be addressed to me, c/o Engineer-in-Chief's Office, Adelaide, enclosing stamped envelope if reply required.

Those readers who are troubled by the depredations of rats might try the effect of gas tar, a little of which may be poured in their burrows and smeared anywhere they frequent. This has given satisfaction elsewhere.

Lord Ranfurly, the Governor of New Zealand, when opening the Wellington Poultry Show commented freely on the difficulty he experienced in getting good table poultry in that colony. He continued—"In fact, I have frequently sold turkeys in the London markets, reared on my own farm, each scaling 24lbs. dead weight, at 1s. per pound." New Zealand is making an effort to induce farmers and others to breed a superior class of bird in view of the export trade. All the States, except this one, have one or more experts constantly engaged in teaching and lecturing. Victoria was a late comer, and only a few months ago the Minister of Agriculture arranged with Mr. W. T. Wright, poultry editor of *The Leader*, to deliver two courses of lectures on poultry subjects. South Australian breeders are awakening to the value of good poultry, and I am glad to note a great interest on all hands; in fact, I frequently have ten or a dozen letters of inquiry in one day, and average several. I have long been desirous of making a series of food experiments, but not having the stock necessary to spare I have to rely on others, and very often the data supplied is not of sufficient exactness to be of any real value. There are a number of new—at least to English breeders—breeds of poultry now obtainable in England which are spoken of very highly. Many of them are well-known continental breeds, and from all accounts they are well worth breeding. The initial cost of importing, say, a couple of pens of each would be too heavy for the ordinary private purse, while, on the other hand the general benefits to accrue from the introduction of such hardy, prolific, quick-growing breeds would be very considerable. The Government experts of Tasmania, New Zealand, and Queensland all have been supplied with imported birds of various sorts, and eggs are supplied to farmers and others at a reasonable rate. The average private individual generally imports very high class show birds, and in consequence makes but little return for his money if he charges two or three guineas a sitting. Many trios of birds cost £10 per head landed, and it takes a lot of eggs and young birds to return the outlay without reference to profits. In the other States prices are much better and more profit can be made. It must be remembered that people here look entirely to the exhibition value of poultry, and, as is well known, even from the best parents only a few "top notchers" are bred in a season. The difficulty many encounter is in obtaining reliable stock birds. There is a vast difference between a good stock bird and a cast-off, or cull. Neither is fit for exhibition, but the stockbreeder will sire first-class and even exhibition birds if suitably mated, while the cull is rarely of any value. A cull is worth very little more than a common fowl, but a stock bird is worth, to the right man, as much as our exhibition bird if he wants to breed and not exhibit. You cannot buy first-class, proved, stock birds as a rule. When breeders find their value they know that the progeny can always be depended upon, and should a sale be decided upon, the hens are sold to one party and the cock to another, and only in exceptional cases is a pen intact parted with.

There is, however, a good opening for either the various new breeds, or the older and better known, and I can confidently recommend readers to import direct. A most favorable opportunity exists. Mr. J. Maude, of Victoria, the best authority on pure-bred poultry in Australia, is now on his way to

England to bring out a large and valuable shipment of poultry for various fanciers and breeders in the Australian States. Some of the following breeds are worthy of notice, and specimens are required of others, as the breed is running out :—

Dorkings.—Silver-grey colored, cuckoo.

Old English Game.—I should like to see some of the white-legged old Derby black and reds; they are small, but splendid for crossing with Dorkings, Wyandottes, or Orpingtons for producing table birds.

Wyandottes.—Any color, but especially whites and blacks; golds and silvers we have.

Plymouth Rocks.—This breed does remarkably well in many places, and it is years since any good fresh blood has been obtained.

Faverolles.—A Dorking-like French breed, is highly spoken of for table, and is hardy, and would doubtless do well here. The Campine and Brackel fowls are common in Belgium, and have a great record as layers of nice-sized eggs, although the birds are on the small side.

Aucous and Black Leghorns, although small birds and rather wild, are wonderful layers of large white eggs. I have seen fine specimens in the other States, but they are quite rare.

Black Hamburgs lay large eggs and eat very little, and are suitable for farms where eggs only are sought for.

Houdans and La Pléche would do well in the North. I saw plenty of the former at Renmark; the are good layers and first-class for the table.

Toulouse and Embden Geese and American Bronze Turkeys are urgently wanted. These cost about £4 or £5 a bird, according to quality. The fowls mentioned cost from £9 to £12 a trio landed, or 10s. a bird more if insured. Anyone desirous of information should communicate with me during September at latest, so as to have time to instruct Mr. Maude, who leaves England in November, and will be back early in the year. This is a chance which may not occur for years. I thoroughly recommend Mr. Maude, who is well known to several Adelaide breeders, and it was he who brought out the Indian Games and Dorkings with which the Boys' Reformatory, Magill, have done such wonders in the show pens. Those who want exhibition birds which have won at big shows in England will have to pay up to £25 or £30 a trio; but I advise good stock birds from which reliable and useful stock can be bred. It is just as important to buy first-class fowls as bulls, sheep, cattle, &c. There is a great demand for stock of the right quality, and I have had much difficulty in securing what I wanted for friends and others, although of rubbishy wasters there is a glut. I should be glad to know of country breeders who owned and bred really high-class healthy birds such as I am often asked for. Low-class birds will not do, and to breed good ones you must have the stock and feed the young birds liberally. Starve your growing stock, and in the end they will starve you. Breed each year a few good ones and feed them well. Do not breed from a hen because she is a hen, and do not hatch more than you can feed and attend to properly. House your birds in well-ventilated, easily-cleaned houses, and give them plenty of room. Overcrowded houses and yards are responsible for much disease. Vermin cause a lot of trouble. I had the feather of a bird sent me the other day, and understood that the feathers generally were in same condition. There were about 500 empty louse eggs on that feather. On examination the eggs had hatched, and no wonder a bird so infested looked sick. The bird was probably of poor stamina, but such an example shows the urgent necessity of close attention and the provision of a dust bath made of road dust, ashes, a little lime, and a dusting of flowers of sulphur.

As the summer approaches, shelter and shade must be provided. This can be done by driving some stout forked pieces of wood into the ground; the forks

will be about 3ft. out of ground. Lay cross pieces of wood and then cover thickly with teatree, rushes, reeds, or even thatch, and fasten down with fencing wire or wire-netting. It is all the better if a little more time is devoted to the matter and the shelter made portable. It will be a cool resort on hot days, and will save the life of many a bird. Drinking water should be kept in the shade; if sun heated the birds will suffer from diarrhœa and soon die. A little Douglas mixture should be kept in the drinking water, which should not be in a metal receptacle. I find a flower pot, 6in. to 8in., does excellently with a cork in the drainage hole in the bottom. To make Douglas mixture pour 1gall. of hot water on $\frac{3}{4}$ lb. of copperas (sulphate of iron), not bluestone. When cool add a fluid ounce of sulphuric acid. If the latter is unobtainable it may be omitted, although it is valuable. If you use metal for mixing or keeping this solution, and use metal water pans, you run the risk of poisoning your birds. It is a splendid tonic. Dose—A tablespoonful to each quart of drinking water twice a week.

CHICKEN POX AT WILLOWIE.

A correspondent of Willowie writes that a disease is prevalent there amongst fowls. The symptoms are scabby heads, which are swelled, birds become blind, mope for a few days, then die. Generally only adult fowls are attacked, but occasionally young chickens. Many supposed remedies had failed to give any beneficial result.

Above was submitted to Mr. D. F. Laurie, who replied:—"This is a form of chicken pox (variola). All affected birds should be isolated and their heads dressed with a mixture of one part of No. 1 carbolic acid in 16 parts of salad oil or glycerine, taking care that none gets into the eyes of the birds. Mixture must be well shaken before use. For twelve birds mix 1oz. Epsom salts, dissolved in hot water with their ration of soft food. The occasional use of a little Epsom salts and sulphate of iron minimises risk of disease.

FARM HINTS FOR SEPTEMBER.

BY THE EDITOR.

Is it true that the growing of a crop of green fodder on the fallowed land will abstract all the moisture, and make the soil too dry to produce a crop of cereals next year? I do not believe it is possible. Bare fallow leaves the ground fully exposed to the desiccating influences of the sun and hot dry winds. Land that is shaded by a growing crop is greatly protected thereby, and the frequent stirring of the surfaces that is necessary for the production of a good crop of summer fodder will favor the admission of warm moist air and the condensation of moisture therefrom. It is true that the production of 3 tons of dried fodder has required about 300 tons (or 3in. depth) of water, but a good deal more than that quantity would be absorbed from the air through the necessary cultivation of the crop during its growth. But, for the sake of argument, let it even be admitted that the growth of some sort of sorghum, maize, or other green crop does render, say, ten acres of fallowed land totally incapable of producing a wheat crop, would that wheat crop in any way be equal in value to that of the crop of green fodder? By turning some of it into silage, and cutting and feeding the rest to the live stock, their health and good condition would be maintained—probably their lives saved—and the cows, especially, would give a maximum amount of rich milk.

When a beast loses condition through absence or deficiency of proper nutritive food, it must be admitted that the loss of condition means loss of money

value to the owner. Not only that—the beast requires a great deal more food (and time) to regain the loss than would have been required to maintain the original condition.

When sowing seed of maize, sorghum (which includes the varieties known as amber cane, dhurra, planter's friend, broom corn, Kaffir corn, millo maize, and many others), it is well to know that heavy clay soils are not the best suited to their growth. A deep, light, rich, friable loam suits them best. They should always be sown thinly in drills. If the soil is not too dry it is advantageous to soak the seed for a few hours before sowing, and run a roller over when sown. Directly the plants are up hoe with the horse hoe, and hoe frequently afterwards, as long as the hoe can be run; do not hoe deeply.

About 50lbs. of seed will sow an acre of maize, in hills 3ft. x 3ft. apart allowing three plants to a hill, or a little less if sown in rows, which is best. From 3lbs. to 5lbs. of any of the sorghums is enough for drilling an acre: 3ft. by 1ft. is a good working distance apart for use of horse hoe.

A good many farmers have discovered that it pays well to use a good lot of farmyard and other manures on a few acres of land near the homestead whereon grass will grow strong and green. Every domestic animal on the farm benefits from this plot, and it is a pleasant spot to look at during several months. The fowls, pigs, sheep, cows, and horses all appreciate the herbage, and their health is maintained thereby.

About the middle of this month is a good time to sow lucern on suitable soil. This plant will grow well on most of the deep, rich, sandy alluvial spots, especially when the roots can get down to water at a depth of 12ft. to 20ft. It is fairly hurdy when established, but the young plants may be killed by night frosts. Soil should be deeply pulverised, made level, worked down very fine. Drill in 10lbs. of seed $\frac{1}{2}$ in. deep, in rows 1ft. apart. Roll at once, and when the plants are up use light harrows.

On well-enriched soil good crops of swedes and kohlrabi may be grown in drills 2ft. x 1ft. Four pounds of seed of either is ample for an acre. If too thick in any place they can be transplanted if care be taken with the tap-roots. The leaves of kohlrabi can be cooked in place of cabbage, and the large bulb-like stems are excellent if cooked when about half-grown; but the chief use of both of these plants is in feeding cattle and pigs.

Broad-leaved Essex rape seed should be sown now on well manured, light, deeply-worked soil, if such is available; but good crops are sometimes raised on ordinary deep wheat paddocks. Four pounds of seed will cover an acre with plants in drills 18in. apart. It makes excellent fodder for sheep, and can be transplanted if necessary.

Another good fodder crop for sheep is white mustard, which, if sown at once on good soil will mature in about ten weeks. Three or four pounds of seed will sow an acre of land if drilled at 3ft. apart. If sown broadcast about 8lbs. of seed may be required. Stock may be put on within six weeks after sowing the seed.

Every one who owns cows, and most of those who own live stock of any other kind, will benefit from having a lot of silage, and stocks of this valuable fodder should be laid in during the next eight weeks. Silage in pits will keep good for two or three years at least, and cannot be injured by fire. Any herbage that is liked by stock can be ensiled, and the greater variety of such plants that are put into the silo the better the silage. The pit may be of any convenient size, but should be divided into chambers or sections by walls if wider than 8ft. or 10ft. The depths may be anywhere from 8ft. to 24ft. The green crop is best cut when the seeds are in the milky condition, but it is usual to begin ensilage when the flowers drop. Maize and sorghums are best when the seeds begin to glaze. It is best to let the crop lie in the field three or four

hours by day, or eight to fourteen hours at night, before carting into the silo. It should be chaffed if possible. When 6ft. to 10ft. depth of stuff has been chaffed in let the silage stand without further addition until its temperature rises to about 130° F.; then put on another 6ft. to 10ft., which will press the lower stratum, prevent access of air, and stop the fermentation and reduce the temperature. Walls should be built around the edges of the pit, so that the silage can be piled up a good bit above the ground level, because the silage will sink to about one-third of its original height. When the pit is quite full put planks on top and then put on about 2ft. depth of stone or earth. The silage will be ready for use within a month, or may be kept a year or two.

Sunflower seed is profitable to grow on land rich in potash. The leaves are much liked by stock and the seeds are very rich and fattening, but must not be fed too liberally. As much as 80bush. of seeds per acre have been raised from sunflowers in Victoria on very rich, moist, peaty soils.

Hay harvest will soon commence, and everything should be ready for it. Beds for the stacks must be laid, and all rubbish cleared out of the way. Stacks should never be built in a hollow where the water can lodge, or where there is a difficulty of hauling in or out of the stack yard. The string binders or mowers, and all implements, wagons, frames, &c., should be overhauled at once and proved to be fit for work. There will be no time for repairs when the hay is all ready to cut. Stacks should be separated, in case of fire, and it is advisable to have them securely fenced against trespass by pigs and other animals.

FARMERS' WOOL.

Shearing will soon commence, and some farmers would do well to pay careful attention to the following cautions:—

1. If the sheep have been washed do not let them remain too long before shearing; else the wool will return to its greasy condition.

2. Be careful not to shear the sheep whilst the wool is wet, because this causes deadness in the wool, and may make it rotten.

3. The shearing-place must be quite clean, free from straw, chaff, chips, and other rubbish, which may get into the fleece and cause trouble, besides reducing its value.

4. When rolling the fleece take care that no lumps of dung, or earth, or other matter is mixed up in any way with the pure wool.

5. No locks, tailings, skin-wool, black, nor cots should be wrapped up inside washed fleeces.

6. Never use twine or anything made of vegetable fibre for tying up the fleeces. Woollen worsted may be used, but the best tie is made by twisting up a piece of the fleece. When jute, hemp, flax, straw, chaff, &c., get amongst the wool the manufacturers cannot pick out every particle; and when the cloth is made and dyed the jute, hemp, &c., show up distinctly, because the dyes that are required for wool will not color the vegetable matter.

INFLUENZA.—Treatment should be directed to relieve the horse of any distressing symptoms and support its strength. Keep the animal warm with comfortable clothing to the body and extremities. Feed on warm bran mash, boiled oats, linseed, or barley. Allow plenty of cold water to drink at any time. Inhalations of hot water give relief, promote the nasal discharge, and relieve the cough. Foment the throat with hot water, stimulated with an embrocation of ammonia and oil. If much prostrated, doses of nitrous ether or carbonate of ammonia in cold water two or three times a day should be given. Give ½oz. nitrate of potash.

THE BOY ON THE FARM.

READ BY MR. S. F. ROBINSON, AT MENINGIE BRANCH.

We often hear farmers complain that they cannot keep their sons on the farm. They drift away to the city or busy centres, attracted, their fathers say, by the chances of short hours, more leisure for amusement, company, and better wages, and because they do not like to feel themselves countrified against other young men, who live in the city and wear fashionable clothes.

It is unfortunately too true that the fathers themselves are often grumbling about farm life, and pretending to envy those who make their living in the city. Is it any wonder then that the lads want to be off?

But let us look fairly at the matter. Has the farm no attractions of its own? Of course it has. First take the farmer's independence. He needs no man's favor and fears no man's frown, and he can speak his mind fearlessly anywhere.

Then, on a farm there is plenty of room. You might even find a place to practice the cornet without infringing the rights of any British subject. Then consider the many hobbies, which constitute the chief joy or add to the pocket-money of other men. Has a man a hobby for prize fowls, bees, fancy pigeons, dogs, for a little dealing in horses, or for making a tennis court in his back yard? Who has the room and opportunities of the farmer's son?

Now, the mention of that tennis court is very likely to provoke a sneer from some good old conservative farmer. With all due respect to him, however, we cannot help thinking that if young Tom works fifteen hours a day part of the year, he has a good claim for "early closing" in slacker times, and we could quote a practical farmer, a member of one of our Branches, who observed a half-holiday on Saturdays, when his boys and girls might invite their neighbors to spend the afternoon in recreation. He declares it paid him too.

But the main idea of this paper is to point out that a farm is a fine place for a lad (or a girl either) to get a good education. I do not refer to "book-learning." That is not necessarily education. Let your boy have all of that you can give him, but remember that its value depends upon use. By education I mean the development of intelligence and acquiring the ability to adapt oneself to new circumstances.

A university graduate might use a buggy for a fortnight and not have the gumption to oil it, and a M.A. might easily find himself outwitted by a broody hen.

It is a noticeable fact that farmers' children show marked development of intelligence at an early age. As tiny three-year-olds they toddle about and watch mother putting thirteen eggs under the old hen; they eagerly await the day of hatching, and feed the callow chickens till they grow into long-legged croaking cockerels and fussy little pullets, and during the whole time their minds are busy thinking, inquiring, and observing—that is, they are being educated.

Then, after a boy leaves school, what a variety of useful things he may do on a farm. For instance, he solders the handle on to his mother's teapot, and he has learned in a most practical way something about the action of an acid, the use of a flux, and conduction of heat, while his hand has lost some of its native clumsiness; or, say his father has given him some carpenter's tools, and he makes a gate, stayed across from corner to corner—he has a more practical knowledge of the fourth proposition of Euclid than most college boys.

And so we might go on illustrating with a little simple forge work, harness repairing, gardening, or arranging a swingle-tree to give a young colt an advantage. There is education in it all. Some may call these things fads, or

urge that the boy will waste time and material. Not a bit of it. He will soon save the cost of his tools by his work, and he is growing into a man instead of perhaps a tailor's dummy.

When he is able to turn out a neat kitchen table or make a water-lift out of a galvanized-iron pipe he will not feel small in the presence of a "Johnny" with a 3-in. collar and a crooked walking stick, nor envy the man who measures ribbons in a stuffy shop, because he will have learned to respect himself.

Do not keep your boy always a boy. Let him grow into a man. One old Scotch farmer lets his boys go to sales and buy. Sometimes, like their elders, they make mistakes, but they are getting their experience while there is a good adviser with them, and they are growing into men instead of overgrown boys.

A farmer's son of my acquaintance took up bee-keeping. He gradually enlarged his operations, studied up the subject, obtained quotations for his honey, and watched the markets. The consequence was he was years ahead of other young fellows of his age, and a good business man, while a visit to the hives in his company was a treat to anyone in search of information.

Might we urge too that a son who works hard on the farm has an undoubted right to such privileges as, say, keeping a saddle horse or a gun, or raising a flock of turkeys for pocket-money. To tell the boys "It will all be yours when I am gone" is not a fair exchange for the whole-hearted service of his youth.

Finally: If a young man is encouraged in a hobby of any kind he is likely to use to his profit time that might otherwise have been worse spent, and accordingly, as he develops his mind in many different directions, he is likely to become an intelligent and useful man.

NO NECESSITY FOR HARD FARE WITH HARD WORK.

Human beings are omnivorous, and naturally like a frequent change of food. The tables of many farmers carry a monotonous continuation of the same eatables; and, although they may not know it, they get tired of home and almost of life. A small piece of ground set apart for a garden would enable the womenfolk to give many a nice dish which cannot be provided where all the vegetables and fruit have to be purchased from travelling hawkers or from the store in the township, to say nothing of the age and bad quality of much of such produce. The greater part of the work can be done with the horses and ordinary farm implements. A good lot of farmyard manure should be used. Small lots of seed should be sown at intervals of a fortnight, as it is only waste to have a great surplus of any kind of vegetable coming in all at once, with no more of the same kind coming forward. Everything should be grown in rows so as to allow of the horse hoe or the hand cultivator working between the plants. There are very few farms where several kinds of vegetables cannot be grown, and in most localities at least a few sorts of fruits. Of course, where water can be used there is much greater certainty; but even without such a supply the following can be grown some part of the year:—Cabbage, cauliflower, lettuce, beans, peas, potatoes, beets, carrots, parsnips, swedes, turnips, onions, tomatoes, cucumbers, pumpkins, squashes, melons, herbs, and many others. The most hardy, drought-resisting fruits are grapes, peaches, nectarines, apricots, and a few varieties of plums.

Instead of spending hard cash for wilted vegetables and stale fruit the good-wife could go into the garden day by day and gather fresh, succulent, tender, delicious vegetables, herbs, and fruits for the family table; and there is no doubt that she would find a few flowers to make the food on the table look more inviting.

HOUSEHOLD PARLIAMENT.

In connection with the Millicent Branch of the Agricultural Bureau there has long been an organisation called "The Grange"; but the name has been considered to be inappropriate, and at the latest meeting it was decided to change the name to "The Ladies' Household Parliament." The membership is unlimited, and there are now twenty-eight names on the roll. The ladies show an excellent example to members of the Branch of the Bureau in regard to attendance at meetings, and they always have plenty of useful, valuable, and practical subjects for their meetings. The subjects are confined mostly to household affairs—management, decoration, cookery—and matters calculated to make homes happy, comfortable, and attractive. Amongst a large number of subjects discussed at the latest meeting was that of "Soups," and the Hon. Secretary (Miss L. Southwell) forwards the following selection:—

Soup (Thick).—Boil a leg of beef, cut in three or four pieces, till all the goodness is extracted, and leave till the next day, when the fat can all be taken off. Take as much stock as required, and to every 2qts. add a cup of pearl barley, an onion, a carrot, and a bunch of herbs, including parsley or a stick of celery, pepper and salt to taste, and a teaspoonful of vinegar; add more stock as it boils down; strain and serve, or, if preferred, without straining, but the bunch of herbs must be taken out.

Potato Soup.—Take 2qts. of any good stock—that from corned beef or ham is best; add six or seven potatoes and two onions, with pepper and salt to taste. When cooked take out the potatoes and pulp them, strain out the onions, put the potatoes back, boil up and serve very hot.

White Soup.—This is a good imitation of oyster soup. Stock made from mutton bones (about 1qt.), one cup of milk or half a cup of cream, a little lemon juice, grated nutmeg, and salt and pepper to taste, thickened with rice flour.

NORMANDY CIDER.

By MR. CONSUL-GENERAL HERTSLET.

The Great French Apple Crop of 1900.

The total production of cider in the sixty-eight departments of France in which apples are grown for the purpose amounted in 1900 to 647,000,000galls. It exceeded by 188,000,000galls. the production of 1899, and by 307,000,000galls. the average production during the last ten years. These figures have only once been exceeded during the past seventy years. Of this total more than one-third was produced in Normandy, and it may therefore be useful to give a brief description of the cider industry in France, with special reference to the methods pursued in the department of Calvados, a district in which the apple crop is a matter of interest to every householder, and where the consumption of cider is practically universal. It may thus be possible to draw some conclusions which may serve the interests of British agriculture.

Selection of Apple Trees.

In the selection of apple trees it is necessary to remember that the quality of the cider depends, first, on the presence and, secondly, on the proper proportion of the following elements in the juice of the apple from which the cider is made.

1. *Sugar* is the most important element of all, since it is transformed, by fermentation, into the alcohol, which gives to the cider its strength as well as

its preservative property. The amount of sugar in the apple determines the market value of the fruit, and is the scale by which such value may be estimated. The richness in sugar is subject to great fluctuations. In some kinds of apples it does not exceed 8 per cent., but in most varieties it attains to 17 per cent.

2. *Tannin* is the next element of importance, of secondary consideration only to the sugar. It is the clarifying and antiseptic principle of the cider. It acts as a preservative and serves to modify the alcohol. In order to attain these results the juice ought to contain a proportion of from 5 to 6 per 1,000, but, unfortunately, most apples contain but little tannin. In Calvados the average is about $2\frac{1}{2}$ per 1,000, but there are, nevertheless, a good number of kinds which yield a proportion of from 4 to 6 per 1,000. Certain sweet apples do not contain a proportion of more than 2 per 1,000, and in orchards where the sweet varieties predominate the trees should be grafted with others which are richer in tannin.

3. *Pectic and Albuminoid Substances* do not have the same importance as sugar or tannin. When their proportion does not exceed from 10 to 12 per 1,000 they have a useful action in giving a certain softness to the cider, and may, perhaps, contribute to its preservation; but when the proportion exceeds that quantity they have an injurious effect, and cause the formation of abundant lees. There is considerable difference of opinion among experts in regard to the action of these substances.

4. *Acidity* is due for the most part to the presence of malic acid. Its action is complex and ill-defined, but it is necessary as an element in the fermentation. The juice of very sweet fruits ferments badly, while sour apples give a very active fermentation. The average proportion of malic acid in Calvados apples is a little more than 2 per 1,000. It rarely amounts to so much as 3 or 4 per 1,000.

It is a good rule, and one generally adopted in Normandy, to mix several varieties of apples, so that in the juice from which the cider is made the merits of one may compensate for or attenuate the defects of the other. Much care and attention is given to this point in the Norman farms.

Classification of Apple Trees According to Seasons.

There are numerous varieties of apple trees suitable for making cider, and as the fruits ripen at different seasons they are divided into three classes. (1) Those of which the fruit ripens in August and not later than the middle of September. (2) Those of which the fruit, while attaining maturity in October, completes in the barn its final stage of ripeness towards the middle of November. This is, perhaps, the most valuable group. (3) Those of which the fruit, removed from the tree in November, before maturity and before the frosts, only attains ripeness in the barn after remaining there for a period varying from the month of December to the month of February.

Details respecting the various qualities of the different species of trees and the best means of securing a good cider by the system of mixing the fruit according to its special seasons would occupy too much space in a general report. Table apples must always be rigorously excluded, as they do not contain the necessary elements for the making of good cider.

Soil and Plantation.

Much depends on the soil and situation, and in many cases it is not worth while to cultivate apples for the purpose of making cider. Generally speaking, the most suitable soil is a calcareous one, in which there is some sand and clay. A slope is far better than flat land, for dampness to the roots is to be avoided, and the soil may, if on the level, become too damp for the best kind of apples. Great importance is to be attached to a scientific planting, so that

the more robust kind of trees may be in the most exposed positions, and thus afford shelter to the later or weaker varieties. The best aspects for planting are south and south-east.

In Calvados the trees are generally planted in orchards, which are used as grazing land, in rows varying in distance from 15ft. to 25ft. apart on all sides. In some districts, especially in the department of the Orne, they are planted round cornfields in such a manner as not to disturb the plough. When the trees are in orchards they generally receive sufficient manure from the cattle, but when in cornfields they are manured every autumn. The trees when they die are gradually replaced by young trees grown especially for the purpose.

Gathering the Apples.

The apples are gathered as soon as they begin to fall. Often, when once gathered, they are left in piles in the orchard or a courtyard, but this practice is injurious, as water penetrates the fruit, depriving it of part of its flavor and diminishing the quantity of sugar it contains. The fruit, when gathered, ought to be placed under cover in a well-aired shed, in piles 12in. or 15in. high, so as to prevent it from becoming heated, and at the same time to protect it from the effects of frost. The apples must be perfectly matured before being crushed, but they must not be over-ripe, and all rotten apples must be carefully excluded. Apples put into the crushing mill shortly after being gathered produce a cider of inferior taste, strength, and keeping qualities.

Crushing the Apples.

The next step is to thoroughly crush the fruit, and for this purpose a hand-mill is generally used in Calvados.

The crushing terminated, the pulp is collected into uncovered vats or tubs, and exposed to the air for about fifteen hours. It is stirred occasionally with wooden shovels, so as to bring the mass into contact with the air. In Calvados it is frequently the practice to place the pulp in the press immediately after it has been crushed in the mill, but this is not recommended.

A portable mill and hand-press costs from £5 to £10 according to size. A fixed mill and horse-press such as is used in the large farms costs from £60 to £100.

Pressing the Pulp.

The pulp is now ready to be put into the press. This consists of a circular cage with a bottom on which the pulp is placed and then pressed by means of a screw, at first slowly, then more rapidly, until the operation is completed. The juice which pours out at the first pressing will make the real cider, which is frequently bottled, and will fetch a high price, perhaps a franc or more the bottle. Cider of this kind and quality is an article of commerce, and is not used locally for every-day consumption.

When the pulp has been thus drained it is taken out of the press and again placed in the vats or tubs, where it is macerated with a certain quantity of water, generally 4½galls. to 22galls. of pulp for fifteen hours or more, after which it is subjected to a second pressing. The result is a juice which will form the cider that is used locally throughout Normandy as a general drink. This cider is placed on the tables of the hotels at meals in the same manner as ordinary wine is so placed in Central and Southern France. It is, of course, of less strength than the first running from the press.

The pulp is sometimes subjected to a third pressing, after being macerated with 2½galls. of water to each 22galls. of pulp, and with the addition of fruit which has fallen by reason of gales or of the attacks of insects. The third pressing is only resorted to in bad seasons.

Fermentation.

The compressed juice of the apple, known as must, having been placed in tubs or vats, the next step is to obtain proper fermentation, the most delicate and troublesome process in the production of cider. The vaults in which the cider is fermented should have a constant temperature of 59° Fahr., neither above or below. The most perfect cleanliness must be observed; no bad smell, no fermentable substance, and no person who is not in good health should be allowed to enter. All movements must be avoided as far as possible. In some cases the must is fermented in barrels or casks, but this does not give so good a fermentation as the use of tubs, inasmuch as oxygen is an essential element in the fermentation, and the liquid when in vats obtains more air. If a difficulty in fermentation should be apparent a small quantity of warm perry, old cider, sugar, or alcohol may be added; but this is not recommended unless it is absolutely necessary to take some measure in order to ensure fermentation.

Fermentation is completed as soon as the tub or barrel, when sounded, ceases to give an indication of the slightest ebullition. This occurs after an uncertain interval, depending in a great measure on the weather. It has been known to take place in three days, but it sometimes requires five weeks as a maximum limit.

The liquid has now become clear, the grosser lees having settled to the bottom and the lighter ones risen to the surface. These two layers of lees, above and below the cider, are most harmful to its preservation, and it is necessary to draw off the cider in such a manner as to prevent the upper layer from penetrating through the cider to the lower one. The cider is drawn off into a cask which has been thoroughly cleansed, and smoked with sulphur.

After the first drawing off the cider undergoes—after a considerable period, sometimes extending to many weeks—a second fermentation, which gives no sound, and is much less energetic than the first. The fermentation manifests itself by the release of carbonic acid. Since the casks cannot remain hermetically closed each one is furnished with a spigot or vent peg which allows the gas to escape and prevents the penetration of the outer air. The spigots are maintained in position for several days. The second fermentation causes a muddy deposit at the bottom of the cask, and a second drawing off is therefore necessary. This has for its object the separation of the cider from its deposit, and the cider should not therefore be drained down to the lees. If this were done there should be a risk of drawing off turbid cider, and the whole operation would be fruitless.

It occasionally happens that, in spite of the two drawings off, the cider still contains some impurities. These can only be got rid of by a clarifying agent, of which the best is catechu, used in the proportion of 2lbs. dissolved in 2galls. of water to 352galls. of cider.

Storage of Cider.

Cider of the first pressing is, as already stated, frequently bottled, as, in fact, it ought to be; but when used as an every-day local drink (*boisson*) it is invariably preserved in hogsheads or casks. Manufacturers make use of large hogsheads each containing about 4,000galls. The tendency to acidity may be remedied by private consumers if the cider, after fermentation, is run into old wine casks, especially those which have contained olive oil, Spanish wines, or Marsala. Ordinary casks which have contained French red or white wines are of no value for this purpose.

Hygienic Qualities of Cider.

Cider is regarded in France as the most hygienic of all drinks, more so than the best of wines. Nearly all the cider made is for home consumption, the exports being practically nil.

Alcoholism in France not Traceable to Cider-drinking.

The local authorities at Havre, with the view of promoting temperance, have recently increased the octroi duties on spirits and abolished those on cider; and cider is sold at the temperance stalls established on the quays in order to counteract the consumption of spirits.

Import of Dried Apples.

Moreover, several thousand of tons of dried apples are imported into France every year from the United States, to be used as a cheap substitute for fresh apples for the purpose of making an inferior cider in the same way as "raisins secs" are used to make inferior wine. The normal price of dried apples is £1 8s. 4d. per 220lbs. It has been as high as £2 4s. 6d. per 220lbs., and at the present time, after a crop more than double the average one in amount, dried apples fetch 17s. 10d. per 200lbs. It is possible that in this direction also there may be an opening for British agriculture.—*From British Foreign Office Reports.*

CULTIVATION OF ORANGES.

By F. E. H. W. KRICHAUFF, CHAIRMAN CENTRAL AGRICULTURAL BUREAU.

Although the whole of the citrus tribe prefer a sweet friable soil of good depth and moisture, without being too wet, or planted in holes that prove to be stagnant puddles unable to drain themselves, the soil is of less importance than irrigation or manuring; only an excess of moisture causes too often disease of the roots; but moderate irrigation, and manuring liberally and regularly, will induce orange trees to become profitable.

Senor Alino, F.R.H.S., of Valencia, Spain, says an acre planted with orange trees may produce 26,500lbs. of fruit, and such a crop probably contains 100lbs. of nitrogen, the same of potash, 105lbs. of phosphoric acid, and 220lbs. of lime, not counting wood and leaves. It is therefore absolutely necessary to give compensatory fertilisers, although somewhat modified in accordance with the soil and its constituents. A clay soil, although poor in phosphoric acid, most likely does not require the whole of the potash returned for some years, as might be necessary for a soil rich in lime and phosphoric acid. Gypsum reduces a soil rich in potash to a fit state for its absorption, and a smaller quantity of this fertiliser may therefore become necessary. Sandy soils are generally poor in plant food, and require all of them—after such a crop, at all events. Senor Alino, however, says that an excess of phosphoric acid results in many but small fruits, well flavored, with a thin skin; and trees that are shy bearers may therefore require more of a phosphatic manure. Potash makes the fruit even more sweet and juicy, while too much nitrogen produces much wood and foliage, but coarse, thick-skinned, late-ripening fruits, containing little sugar or aroma, and they do not keep well.

It is admitted that dung and other organic manures are useful as an aid to commercial fertilisers, which, however, are so much quicker consumed; but it is not advisable to give horsedung more frequently than once in three years. Orange trees are never quite without a movement of sap at any time of the year, and apparently require plant food to be given more than once a year, especially nitrogen, although once is sufficient for most other fruit trees.

Senor Alino wants a deep annual ploughing, which it seems to me must injure the large number of fibrous roots which, here at least, are generally found to be near the surface. When manuring, a slight stirring of the surface by a four-pronged fork seems to me far better, and does not necessitate trimmed-up trees to enable ploughs to run near the stems. Low branches are a good pro-

tection of the trunk against our frequently too powerful sun. He forms round holes around his trees, and says that neither water nor manure should be allowed to enter. This certainly is a statement which has surprised me and probably most of our orange growers, as our circle formed around a tree was expressly made to water it better. He warns orchardists also to spread fertilisers not within a hand-breadth around the trunks.

Young trees require per acre 325lbs. of nitrate of soda (or an equivalent of 260lb. of sulphate of ammonia), 264lbs. of a phosphatic manure, and 60lbs. of sulphate of potash in preference to muriate of potash. For old trees in full bearing, 350lbs. of sulphate of ammonia, or 440lbs. of nitrate of soda, 600lbs. of superphosphate of lime, and 80lbs. of sulphate of potash may be required. If nitrate of soda is to be used, Thomas phosphate should be applied as phosphatic fertiliser. Lime, although it may be required, should not be given with the above fertiliser; either some time before or later. It is, however, well to apply perhaps both forms of nitrogen, viz., one-half of the doses of sulphate of ammonia in our winter, and one-half of the nitrate of soda three months later, when such division of the nitrogen may prevent the dropping of the young fruit. If the trees are not vigorous give but little potash; if too luxuriant, with few fruits, omit the nitrogen and give more superphosphate. In the United States a fertiliser is used consisting of 4 per cent. ammonia, 5 to 6 per cent. phosphoric acid, and 13 per cent. potash, spread broadcast twice a year, with great results.

ORCHARD NOTES FOR SEPTEMBER.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

Usually the increasing power of the sun will be noted now in the surface of the soil. Where a second ploughing or skim digging is practised, no time should be lost in performing the work. The scarifier in the large orchard and the hoe in the small fruit garden should at once reduce the freshly-turned cloddy surface to a fine state of tilth. If this is not done before the moisture is evaporated from the top of the newly-turned soil, its proper performance becomes a difficult matter. The cultivator will probably have to wait until a soaking rain again renders the clods breakable. The enterprising Americans have proved by demonstration that a pulverised layer 4in. in depth forms a better "dust blanket" and keeps the moisture in longer than the shallow inch or two frequently broken.

In large orchards the two-horse "Planet" cultivator is steadily advancing in favor. It is light of draught, and, besides performing the work well, enables the workman to cover a large area in a short space of time. Advantage could be taken of this first stirring of the moist soil to apply a quickly-dissolving fertiliser to all trees lacking vigor.

Citrus trees just beginning to put out shoots would be benefited largely by a dressing of from 1lb. to 6lbs. of superphosphate to the tree. The exact quantity could only be defined in the presence of each individual tree. The method of application would consist of sowing the manure prior to the cultivator passing over it. The area to be dressed around the tree would depend upon its size and age. If the orchardist is observant he can gauge the spread of the roots accurately enough for the purpose.

The ploughing or digging under of winter crops of peas or weeds grown for manurial purposes should be done while the ground contains plenty of moisture. If postponed until this is scanty, the covered vegetation does not decay rapidly, and the soil is held open and over-aerated, while at the same time the upward motion of capillary moisture is checked to an injurious degree.

While desirous of preventing the rapid loss of capillary moisture through the surface, it is very necessary for the well-being of the roots that its course should be unbroken up to where it meets the cultivated layer of surface soil. Those gardens which are in a position to receive overflow waters from roadside drains or small creeks should be thus irrigated whenever storm waters are passing. The writer has seen wonderful results from the consistent adoption of this method in some of the dry Northern districts.

The planting of citrus trees will still be in hand. If the young trees have sent out tender shoots, and only a limited supply of roots is secured in the "ball," pinch out these sappy growths completely and compel the tree to make a new start. If the top is strongly developed and the roots only a few inches long and devoid of the original soil, cut the tops back severely. This should be done even though only a bare stem be left.

In carrying citrus trees about the orchard to the positions selected for planting them, precautions should be taken to protect the roots from sun and wind. If they are practically devoid of soil, keep them in a vessel filled with thin clay puddle of the consistency of paint.

The pruning of citrus trees is usually undertaken when the crop of oranges is removed. Unfortunately our growers do not appear to find time to attend to this highly desirable work. It may be taken for granted that all water shoots upon the inner branches of established trees should be removed. All dead wood should be removed by cutting the branch back to a junction where healthy growth is found. The internal laterals should be thinned out to admit the light and thus assist in averting diseases, &c. The terminal twigs benefit by thinning, as each year three or four attempt to grow from each one of the previous year. On most sections of citrus trees the laterals which arise from the upper side of any main branch outstrip their fellows of a similar age. These sometimes prove very useful in raising the height of the tree by replacing the leading shoots which have bent into a horizontal position and lost their ascendancy.

The grafting of most deciduous trees will be carried out in many places during September. In last month's *Journal* an illustrated article on this subject was published. I would refer readers to that for details.

The spraying of apple and pear trees with Bordeaux mixture for the prevention of the black spot, or fusicladium, will be undertaken as soon as the winter buds release their clusters of florets. This was also dealt with in detail last month. If the black aphid of the peach makes its appearance, no time should be lost in spraying or fumigating the affected trees. There is no spray at present known to be more generally effective than that made from tobacco and soap. Two ounces of strong tobacco and 4ozs. of common soap to each gallon of water will kill every aphid it touches. The tobacco is boiled until the nicotine is extracted; then the refuse is strained out. This liquor is mixed with the water in which the soap is dissolved. A weaker solution would be cheaper and may do quite as well, but the writer recommends the above after several seasons' actual use. It is injurious to spray any tree when it is in bloom.

In orchards where the codlin moth abounds no time should be lost in scraping away the loose bark which cracks up after the first few sunny days of spring. These scrapings as well as the cleanings of knot holes should be burnt, as the uninjured larvæ in their cocoons are often attached to the pieces of bark and refuse. All bandages should be examined and winter larvæ killed before replacing the bands upon the trees. The codlin moths arising from the larvæ which have wintered in these places commence to emerge—in early districts—at the beginning of October.

The time is now opportune for closing the windows and other vents of all fruit-rooms that have contained apples and pears. This will prevent moths

which may emerge from time to time from escaping into the orchard. A fumigating with sulphur will be of great benefit in destroying germs of fungus growths as well as any insects that may be reached by the fumes.

The harvesting of orange and lemon fruits will be progressing rapidly, and the sooner the ripened fruits are gathered the better for the welfare of the trees. The demands of seed maturing and the ripening of the fruits generally are considered to be of a vitality-reducing nature. The trees are now starting into young growth, which, to be robust, must have the undivided energies of the whole tree.

Plantations of strawberries will now be in bloom, and the drain upon the resources of the plants will increase until the crop is harvested. Manures should have been applied already; still it is not too late to assist the plants. A dressing of about 1oz. of superphosphate applied to each plant will do good if given just before a rain falls. The super. *should not be thrown upon the plants*, but either placed a couple of inches away on the uphill side or sprinkled around each plant an inch or two outside of the spread of the foliage. The writer finds that it is economical, and ensures an even distribution of the fertiliser to use a small tin with a perforated top, after the fashion of a pepper box.

SPRAYING FRUIT TREES IN BLOOM.

BY GEO. QUINN, HORTICULTURAL INSTRUCTOR.

Although orchardists in this State do not practice spraying their trees whilst in full bloom, the following notes taken from a bulletin issued last December from the New York Agricultural Experiment Station may be of some interest to them. Owing to the alarm raised respecting the wholesale poisoning of bees and other pollinating insects, alleged to be caused by spraying fruit trees when in bloom, a law had been passed during 1898 in the State of New York making the practice illegal.

A large section of apple-growers, however, held that this law was founded on erroneous observations. They further contended that insect and fungous pests were more effectively controlled by spraying the trees with a combination of Bordeaux mixture and Paris green during the period of bloom. So strong had this opinion grown that the authorities at the Cornell University Experiment Station at Ithaca and the State Experiment Station at Geneva were approached simultaneously with requests to thoroughly test the matter.

The Legislature amended the law to make such tests permissible. The orchards chosen for the tests were widely dispersed and differently circumstanced. The season (1900), however, proved one of those during which the fusicladium (scab) was held in check by climatic conditions; in other words, sprayed and unsprayed crops were alike free of scab throughout the State. Respecting the effect of the spraying upon the essential organs of the flowers the Cornell experiments pointed to no injury being inflicted. Out of eight experimental plots six are reported as giving no difference, and two a slightly increased setting of fruits in favor of the trees sprayed while in bloom.

No evidence is forthcoming respecting the injury to honey bees.

The investigators of the State Experimental Station went more deeply into the subject.

In the laboratory tests upon the germinating powers of pollen grains were made in tubes. Cultures were made in (1) distilled water; (2) in sugar solutions of various percentages of cane sugar in water; (3) in weak sugar solutions combined with various dilutions of Bordeaux mixture made in the ordinary way; (4) in Bordeaux mixture made of chemically pure ingredients; (5) in

Bordeaux mixture combined with some arsenical compound as commonly used in orchard spraying; (6) with arsenical spray mixtures alone; (7) and with lime alone. The flowers from which the pollen grains were taken were opened in the laboratory, and each series as above set out were tested with pollen taken from the same anther. It was believed this method would give pollen of a uniform quality. In other respects the cultures were treated alike while under observation. The results of each culture in the tests are set out in detail, but the following sums up the matter fully:—

“If before pollination occurs the stigmatic surface of the pistil should be covered either with Bordeaux mixture alone, or with arsenical poison alone of the strength commonly used in spraying orchards, there would be no germination of any pollen which might afterwards reach the stigmatic surface, and so fertilisation would be prevented and no fruit formed. Even the presence of lime alone, of the strength commonly used in spray mixtures, prevented the germination of pollen. Bordeaux mixture was diluted in aqueous sugar solution to 500, 200, 100, 50, 2, and 1 parts in 10,000 parts of culture media in which various kinds of pollen were introduced. Even when diluted to 50 parts in 10,000 it prevented germination to a large extent, and where germination did occur the growth which followed was decidedly slow and the pollen tubes were dwarfed. When diluted to 100, 200, and 500 parts in 10,000 either no germination or practically none was found.”

In the orchard on some trees branches were sprayed in early bloom, others repeatedly during the blooming period, others during the later stage of the blooming, and others were not sprayed at all. The results, as shown in the setting of the fruits, went to indicate that spraying in early bloom diminished the setting somewhat, spraying repeatedly almost prevented any setting, late spraying made little difference in the setting; but the branches which were not sprayed while the blooms were open set the most uniform crops. During these tests special attention was directed to selected clusters of blooms, so that more definite data could be secured. In some cases the spray mixture had a corrosive effect and killed the tissues of the stamens and pistils. Other pistils with particles of spray mixture on the stigmatic surfaces awaited fertilisation for several days apparently unharmed and healthy, but eventually withered and died. A number of blossoms were observed with the spray particles upon the stigmatic surfaces, but none of these set fruits. It appears, therefore, that in these cases the spray mixture inhibited the process of fertilisation, and thus eventually caused the death of the entire blossom. Blossoms which have been open several days before they were sprayed seemed to have reached a stage where the treatment did not check the progress of fertilisation, and the fruit set as abundantly as it did from corresponding blossoms which were not sprayed. In a series of tests made at the same time upon blocks of trees a spraying when in bloom appeared to lessen the setting of fruits, but the quality apparently was improved in consequence, and very little damage arose commercially from the treatment; the marketable value of crops from sprayed and unsprayed trees appeared to vary but slightly.

These results are explained by the fact that all of the blossoms are not at any one time in a condition to sustain injury from the spray. Owing to this the first to open—usually the central buds in the cluster—may be destroyed, and later opening side buds escape, or *vice versa*. The weak solutions of Bordeaux mixture used in the laboratory tests are very interesting in the light of the similarity between the germinating powers of the spores of parasitic fungi and of pollen grains. The results are very encouraging in this respect. As in the case of the Cornell tests, no reference is made to the danger of poisoning insects; consequently we must conclude that this has been reserved for future investigations.

NOTES ON VEGETABLE-GROWING FOR SEPTEMBER.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

Excepting in the cold, late, mountainous districts, warmth-loving vegetables will receive attention now. The setting out of tomato plants into their permanent positions must be carried on with caution. Plots of ground known to be visited by late frosts should be avoided unless the grower is prepared to use artificial shelters. The practice of making a shelter for each plant from the half of a kerosene or oil tin is extending every season. The tins are divided lengthways by cutting down two diagonal edges. The top of the tin is retained upon one half and the bottom upon the other. These ends form the roof, while the two sides are placed to ward off the cold or cutting wind. A stake extending the full length of the tin is nailed in the right angle, and the sharpened point projects about 9in. This is thrust into the soil, and thus holds the "shelter" in position. In other places a bough of a tree is used; the stem of the bough is pushed into the soil, and the twigs and leaves being held over the plants keep off the frost. A frond or two of bracken fern is also used by some growers to effect the same object.

In the earlier and warm districts of the North pot-raised plants of cucumbers may be set out if adequate shelter is provided. Small boxes consisting of sides and ends only, upon which a pane of glass can be laid as a cover, are the best for field work. When one considers the warmth which may be obtained from glass-covered structures, it is just a question whether it would not pay some enterprising man who understood his business to erect a cheap glass structure under which early crops could be raised. In such early localities referred to all kinds of melons, marrows, cucumbers, and trombones could be sown in the open garden early in this month. In districts of medium earliness, such as the plains around Adelaide, not much advantage is gained by sowing until the temperature of the soil rises somewhat.

Small beds of radishes, cresses, and lettuce may yet be sown upon the plains where water is at hand for irrigating if required.

In making sowings of any kind of seeds now, care in covering them should be observed. The increasing power of the sun's rays will tend to bake the surface of the soil and form an almost impenetrable crust above the tender germinating growths. A thin coating of pulverised manure, or well-mixed loose loam, answers the purpose. When sowing summer-growing beans it is a good plan to mix a sprinkling of superphosphate with this covering material.

All the members of the melon family are particularly partial to soils rich in well-decayed organic matter. The best way to apply such is in the form of stable manure. The manure should be thoroughly decomposed if mixed with the soil. When melons are grown by irrigation, carried on by means of the furrow system, the "hills" should be closer together, so that water sent down the whole length of the furrows may be utilised. It is a good plan to sow the seeds in small mounds or ridges, so that the water does not lie in contact with the stems as they emerge from the soil.

The planting of onions will still be in hand in some localities. Small growers should observe that fairly good-sized pickling bulbs may be obtained from most kinds of onions if they are set closely together and not stimulated too much.

The surfaces of all beds carrying growing crops should be kept in a fine loose-tilled condition. This not only checks weeds, but aerates the soil, and, as scientists tell us, provides suitable conditions for the active work of those bacterial agencies now considered indispensable in the liberation of plant foods.

The need for special attention to thinning out growing crops of carrot, parsnip, beet, turnips, &c., will be apparent by the rapid spreading of the foliage. There is not a great deal gained by deep-growing root crops from surface dressings of artificial manures. Turnips will be forwarded with liberal sprinklings of superphosphates, and occasional small quantities of nitrate of soda being hoed in. Several small applications are preferable to one heavy dressing. If rain does not fall almost immediately a light watering given shortly after will facilitate the action of those manures.

Prickly spinach plants may be permitted to grow thickly until the leaves reach the size of a human palm, when the thinnings can be utilised.

Rhubarb beds will benefit by a light dressing of superphosphate being washed into the ground.

The asparagus shoots will soon start, and a liberal quantity of superphosphate will stimulate the plants and enable them to tide over the cutting soon to follow. If no salt has been applied a sprinkling will be of advantage to asparagus. Heavy dressings, however, are best applied earlier in the wet season. A mulching of decayed stable manure will be of value to both rhubarb and asparagus beds.

Growing crops of potatoes should be carefully hilled or hoed as they reach a few inches in height.

The topmost points nipped from rank growths of broad beans is accepted as a good aid to pod formation.

In slightly-sheltered seed beds sowings of tomatoes and chilies for successional plantings will be made. These will provide the plants for the bulk crop.

HOUSEHOLD HINTS.

BAKING POWDER.—Take $\frac{1}{2}$ lb tartaric acid, $\frac{1}{2}$ lb. bicarbonate of soda, $\frac{1}{2}$ lb. potato starch. Powder and thoroughly dry them separately, then mix in a dry room; pass the mixture through a sieve, and at once put it up in packages. Press each package till hard, and cover with tinfoil to exclude the air, or put the powder up in small tins. Cornflour may be used in place of potato starch.

SEIDLITZ POWDERS.—The following are excellent recipes for seidlitz powders. The first is made up in two papers; the other is one mixture. 1. Put in a blue paper 2dr. of Rochelle salt and 40gr. bicarbonate of soda well mixed together. In a white paper put 38gr. of tartaric acid. One of each powder to be used with $\frac{1}{2}$ pt. of cold water. 2. Take 12oz. Rochelle salt, 4oz. bicarbonate of soda, $3\frac{1}{2}$ oz. tartaric acid, 1lb. white sugar. Reduce to fine powder and dry separately; sprinkle $\frac{1}{2}$ dr. essence of lemon over the powders, and then mix well. Keep well corked. Dose—Dessert spoonful or more.

WATERPROOFING CALICO.—In making calico waterproof use boiled linseed oil with which a little patent drier has been mixed. The best material for waterproofing purposes is strong unbleached calico or holland. This should be soaked in water and hung out to dry without wringing. When quite dry spread out on a level surface, and apply a thin coat of the oil. Hang the material in a cool draughty place to dry, and then apply a second and, if necessary, a third coat. Three thin coats are better than two thick ones.

CANDIED PEEL.—To make candied peel choose sound, fresh lemons or citrons, and cut them into quarters lengthwise. Remove all the pulp, and soak the rind in salt water for three days, and afterwards in cold water for a day. Next boil it in fresh water until it becomes tender; then drain the rind and cover it

with a syrup made with 1lb. of sugar to 1qt. of water. The rind will begin to look clear in about 30 minutes, when it must be again drained. Now make a thick sprup, allowing 1lb. of sugar to 1pt. of water. Boil the rind in this over a slow fire until the syrup candies. Then take out the rind, drain it, and dry in a cool oven.

INSECT POWDER.—The best insect powder is made from the *flowers only*, just opened, of *Pyrethrum cinerariæfolium* (known also as *P. dalmaticum*). The plant does not readily grow from seed, but slips and divisions of the plant grow quite as readily as those from the common *chrysanthemum*, which is nearly allied to *Pyrethrum*. The flowers are first dried on sieves in a shady place, then ground or pulverised, and the powder put away in air-tight jars or tins.

BREADSTUFFS SHIPMENTS.

The export of breadstuffs during the first half of this year was in itself satisfactory, and compared with previous periods was larger than for many years past. Even in 1894, when there was a slightly larger surplus to handle, shipments during the first half of the year were only 4,530,082bush. of wheat and 27,450 tons of flour, of a combined value of £728,356. From January to June of the current year, indeed, exports exceeded those for the whole of 1900, and compared with an aggregate of 6,303,952bush. during the whole of 1894. Flour presents the largest total since the same six months of 1896, when the figures were 37,838 tons, valued £373,372. Amongst the places to which less breadstuffs has been sent this year are Victoria, New South Wales, Natal, and Delagoa Bay. In the following is shown the exports of South Australian wheat and flour during the first six months of the past five years:—

Year.	Wheat.		Flour.	
	Bushels.	£	Tons.	£
1897.....	6,231	1,758	9,723	130,073
1898.....	23,000	5,354	13,429	150,209
1899.....	2,146,445	283,759	24,709	162,584
1900.....	2,518,939	340,589	29,617	191,251
1901.....	4,826,435	665,458	35,536	221,589

The following figures show the principal destinations of the exports during the first six months of 1901, the figures for the corresponding period of last year being shown in brackets:—

Destination and Port of Shipment—	Wheat. Bushels.	Flour. Tons.
United Kingdom—		
Port Adelaide	806,022	2,189
Port Pirie	659,182	—
Port Germein	409,634	—
Wallaroo	351,193	—
Port Augusta	269,135	—
Streaky Bay	222,637	—
Port Wakefield	46,653	—
	2,754,456	2,189
	(1,499,510)	(916)

Destination and Port of Shipment.	Wheat. Bushels.	Flour. Tons.
Cape Colony—		
Port Adelaide	337,988	4,308
Port Pirie	282,865	1,294
Port Germein	79,006	—
Port Augusta	71,412	—
Port Victoria	60,876	—
Port Broughton	51,526	—
Tumby Bay	41,501	—
Wallaroo	253,896	—
	1,179,570	5,602
	(830,610)	(2,367)
France—		
Port Adelaide	2,345	—
Port Germein	105,178	—
	107,523	—
	(18)	—
Belgium—		
Port Adelaide	24,090	—
Wallaroo	43,064	—
	67,154	—
	(Nil)	—
St. Helena—		
Port Adelaide	620	200
	(714)	(255)
Germany—		
Port Pirie	103,420	—
	(Nil)	—
Chili—		
Port Adelaide	65,476	—
Port Augusta	104,668	—
Port Pirie	177,690	6
Port Victoria	37,398	—
Wallaroo	148,070	—
	533,308	6
	(60,011)	—
<i>Total Shipments.</i>		
Port Adelaide	1,312,409	30,128
Port Augusta	435,715	—
Port Germein	593,818	—
Port Pirie	1,223,157	3,828
Port Victoria	98,274	—
Streaky Bay	222,637	—
Port Wakefield	46,653	—
Overland	4,516	1,467
Port Broughton	51,526	—
Tumby Bay	41,501	—
Wallaroo	796,220	80
River ports	—	32
	4,826,435	35,535

WORMS IN HORSES.—Give wineglassful of turps in a pint of raw linseed oil, followed by feed of pollard and a bran mash occasionally, or keep without feed over night, and in the morning give 1½ pts. of raw linseed oil.

STRANGLES.—Good nursing is the main thing. Many horses recover without any other treatment. Steam the nostrils with bag containing hot bran sprinkled with eucalyptus or carbolic oil. Bran mashes with a little nitre in are useful. If necessary, tumor should be lanced when ripe. Give 2drms. to 4drms. of nitrate of potash in drinking water, say a bucketful, with the chill taken off.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Company report :—

September 2, 1901.

Exceptionally favorable weather conditions have prevailed during the month, so that the outlook has much improved. The rains were widely distributed, many of the usually least favored districts reporting the best fall for years, so that vegetation is everywhere coming along rapidly, and the probabilities of a bountiful season daily becoming more assured. As the crops, however, are generally speaking quite a month later than ordinarily, the position cannot be reckoned as too safe yet, for, unless the spring proves a belated one, the most promising of appearances in young crops can speedily be blighted by the dry hot winds we so often experience in September and October, so that the outlook is still, undoubtedly, a little precarious; but a few weeks of favorable conditions would render the position safer, and we trust that in our next we will be able to report with more confidence on the season's prospects. The outside pastoral country is looking better than it has for years past, and is being gradually again re-occupied, and being vermin-proof fenced in with good results.

Absence of complaints as to dullness of trade justifies the assumption that business is generally satisfactory in town and country, though we are now passing through the usually dull time of year. The improved outlook is giving a more confident tone, and there is still a pleasing dearth of financial troubles amongst small traders, so that commerce can be reported sound. The goldfields and copper mines continue to increase their outputs, the new Tarcoola finds attracting increased attention during the past month, and to some extent justifying the hope that the hundreds of miners who are being thrown out of employment in the Broken Hill district owing to the serious collapse in the lead market, may find lucrative employment in the direction of Tarcoola.

The activity in the world's breadstuffs market when last we reported did not long continue. The scare about the effects of the heat wave on the crops in America, although to some extent intensified by the reported most disappointing yields in the best wheat districts of Russia, did not succeed in sustaining European prices in face of the fact that America is harvesting her biggest record yield, Manitoba and some other parts showing phenomenal returns. London quotations have in consequence fallen from 30s. to about 28s. 3d. per quarter average for off coast United Kingdom cargoes of Australian wheat, and buyers not very anxious to operate. A fairly active month's business in Australia is recorded. Sydney seems to have shipped about all she can spare, and millers are paying 2s. 11d. for their wants. Favorable opportunities for cheap freights from Melbourne, as low as 17s. 6d. per ton for wheat to London and Liverpool, have given Victorian producers the benefit of a higher market than ours again, so that 2s. 10d. to 2s. 10½d. is being readily paid by shippers and millers there. Locally wheat has also been firm, chiefly in consequence of good demand for flour from South Africa, where Adelaide brands appear to be regaining the position that for a time they seemed to have lost, buyers there now showing marked preference for South Australian flour. Local trade continues to be mostly restricted to deliveries to bakers under old contracts. In forage lines hay and chaff have been dealt in somewhat freely for export, but very general rains throughout the Australian States have again stopped buyers' operations here. Feeding grains quiet and unaltered.

Local stocks of potatoes being exhausted we are now dependent upon imports. Tasmania and New Zealand mostly supplying our wants, so that values here are ruled by the eastern States. Our early locals should be soon coming in, but the very dry time we had, with heavy frosts in the beginning of winter renders it probable the yield of early locals will be poor this season. Stocks of onions have been so reduced that extreme rates prevail, and only a famine trade is doing in this line.

In dairy produce, the expected heavy increases in supplies were hardly realised, the continuance of cold damp weather retarding the flush of milk that usually shows in South Australia during August, so that not until a few days ago was even a small surplus of butter available, and which is being keenly competed for, local bakers seeming eager to secure early for packing their future stocks. The price steadily decreased during the month, but is still fully 2d. above the export values, but which we may soon expect to see reached. Eggs have been in heavy supply, though strong export trade kept prices well up until ten days ago, when the seasonable run-down set in, and what may be reckoned about bottom rates have been touched. The Westralian demand has slackened, as it did this time last year, showing that local production is a growing factor; but their annual season of plenty in eggs, fortunately for us, is not likely for some years to be a lengthened one. During the next few months we must expect low rates, but the outlook is not discouraging to poultry keepers, who are also making good prices for their surplus stock. New Zealand quotations are steady, and are controlling values in cheese here, as bulk of our requirements are being imported from there. Bacon for a long time past has ruled relatively much lower in price than butcher meat, but a rise of 1½d. per lb. in former re-establishes a better approximation. Honey has again slightly eased, chiefly owing to the cheapening of butter causing lessened local demand. Beeswax is very scarce. Almonds continue short of trade wants.

The continued dearthness of butchers' meat caused rates to rule higher in pork and veal during the month, heavy Friday catalogues realising satisfactory prices. The same causes more than sustained the previously high ruling rates for poultry, even turkeys, which for some time had been selling relatively low, improving in value.

MARKET QUOTATIONS OF THE DAY.

Wheat.—Port Adelaide shipping parcels, 2s. 9½d. to 2s. 10d.; farmers' lots, 2s. 9d. to 2s. 9½d. per bushel of 60lbs.

Flour.—City brands, £6 5s. to £6 10s.; country, £6 to £6 2s. 6d. per ton of 2,000lbs.

Bran and Pollard.—10½d. to 11d. per bushel of 20lbs.

Oats.—Local Algerian and dun, 2s. to 2s. 3d.; prime stout feeding white, 2s. 6d. to 3s. per bushel of 40lbs.

Barley.—Malting, 3s. 2d. to 3s. 9d.; Cape, nominal at 2s. 3d. per bushel of 50lbs.

Chaff.—£3 5s. to £3 10s. per ton of 2,240lbs., bags in, dumped, f.o.b., Port Adelaide.

Potatoes.—Tasmanians, £8 12s. 6d. to £8 17s. 6d.; New Zealand, £8 10s. to £8 15s. per 2,240lbs.

Onions.—£16 to £18 per 2,240lbs.

Butter.—Creamery and factory prints, 11d. to 1s. 1½d.; private separator and best dairy, 10½d. to 11½d.; good store and collectors', 9½d. to 10½d.

Cheese.—South Australian factory, 9½d. to 10d.; New Zealand, 10d. to 10½d. per pound.

Bacon.—Factory-cured sides, 7½d. to 8½d.; farm lots, 7d. to 7½d. per pound.

Hams.—South Australian factory, 7½d. to 8½d. per pound.

Eggs.—Loose, 5½d.; in casks, f.o.b., 7d. per dozen.

Lard.—In bladders, 8d.; tins, 7½d. per pound.

Honey.—2d. to 2½d. for best extracted, in 60lb. tins; beeswax, 1s. 2d. per pound.

Almonds.—Soft shells, 6½d.; kernels, 1s. 2d. per pound.

Gum.—Best clear wattle, 2d. per pound.

Dressed Poultry.—Turkeys, 6½d. to 8d. per pound; ordinary fowls, 1s. 5d. to 1s. 7d. each.

Live Poultry.—Good table roosters, 1s. 11d. to 2s. 4d. each; prime heavy weights, to 2s. 8d.; good hens and fair cockerels, 1s. 6d. to 1s. 10d.; ducks, 2s. 2d. to 2s. 7d.; geese, 3s. 6d. to 4s. 6d.; pigeons, 7d. to 7½d.; turkeys, 6½d. to 8d. per pound, live weight, for fair to good table sorts.

Carcass Meat.—Bright shop porkers, handy weights, sold from 5½d. to 6½d.; medium quality and dull lots, 4d. to 5d.; good baconers, 4½d. to 5½d.; rough and heavy, 3½d. to 4d. In veal, prime is worth 3½d. to 4½d.; but most carcasses coming in are only poor and medium, selling at from 1½d. to 3½d.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, flour, and forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese.

WEATHER AND CROP REPORTS.

BALAKLAVA (August 23).—At the end of last month a good soaking rain fell, but since then it has been dry for this time of year. Crops are backward, and complaints are still heard of scarcity of feed where sheep are kept. Lambing has been fairly good. Fallowing is finished, and most of it worked down in readiness for a good rain to start rubbish. Stock are only in fair condition on account of cold weather and feed not too plentiful, but no complaints of sickness.

BOULEROO SOUTH (August 27).—Since the rains have set in the crops are growing fast, and there is a marked difference shown in those sown with phosphates to those where no manures have been used; the latter are only just coming above ground, while the former are well up and growing fast. Feed looks well. Rainfall for month to date, 2'56in.

BOOTHBY (August 21).—The present season is considered the best experienced for years. Some of the crops are well out in ear, and a few farmers have commenced cutting hay, some crops yielding about 1½ tons per acre, and up to the end of July the rainfall totalled 13'55in. for the year.

BOWHILL (August 27).—The weather has been dry and warm, with only a little thunder and a few light showers. Crops are very backward, and without a wet spring there will be little wheat.

CARRINGTON (August 22).—Splendid rains have fallen through the district, up to 2½in. being recorded. The crops are growing well, and with a good spring a very fair crop may be reaped. Stock are poor, but it is expected they will improve in a few months.

CRYSTAL BROOK (August 26).—Another favorable month and prospects are much brighter. Feed is now coming on and stock are thriving. The wheat, though much behind this year, is looking healthy, and with another good rain the hay harvest should be a fair one. Rainfall from July 27, 2'07in.

JOHNSBURG (August 26).—Splendid soaking rains have fallen during the past fortnight, and the drought country has at last had a thorough soaking. Dams and tanks are all overflowing, and much of the low-lying land is under water. The season is rather late, but with favorable weather a good return may be expected. The wheat and feed are growing nicely, and prospects could not be brighter. The country eastward has had more rain than here, and the bush land looks greatly revived. Stock are improving. Total rainfall for nine days, 2·46in.

LUCINDALE.—A few nice showers have fallen this month, enough to keep the feed and crops growing. The weather has been generally cold, with a few nice warm days. Grass is a little backward, but strong. Crops look fairly well. Stock is in a very healthy condition. Lambing percentages are not high, but the lambs are strong and in good heart.

MELROSE (August 26).—Crops are looking healthy, though as yet somewhat backward. Grass is coming on well, with the result that stock are improving in condition. A number of horses have recently been suffering from strangles. Rainfall since July 19, 5·32in. Still showery.

MILLICENT (August 22).—Owing to cold weather early in the month, crops did not come on well, but are showing signs of good growth now. Stock looking healthy and in fair condition. Lambing generally very good, and country drying fast. Rainfall to date, 1·11in.

NANTAWARRA.—Feed among the stubble in most cases is good, while on ordinary grass land it is very backward. Stock generally are not improving in condition. Fallowing is about finished.

OKOROO (August 28).—Good rains have fallen over the whole of the district. Parts of the Wallaway Plains are flooded. Snow has fallen here.

PASKEVILLE (August 26).—For last three weeks the weather has been comparatively dry, but the crops have done very well, owing to the ground having had good soaking rains during the winter. Nice showers have fallen to-day, which were much needed. Feed is still scarce, and stock require supplementary feeding. Fallowing is finished, and farmers are busy stump-cartaing. Fats are unknown; poor stock are plentiful and cheap.

PINE FOREST (August 26).—Experiments with varying quantities of superphosphates are so far greatly in favor of the heavier dressings. The final results will be watched with great interest. Good rains have fallen this month. The total rainfall for the year, to date, amounts to 8·07in., as compared with 9·45in. for same period last year.

PORT GERMEIN.—The weather during the past month has been very favorable. With the splendid soaking rains, the absence of frosts, and with a few warm days the wheat and grass are making rapid growth. The crops will be thin owing to the past drought, yet the farmers anticipate a fair harvest with a late spring. About 4in. of rain have fallen since July 26. Stock generally are improving in condition, but fats are very scarce.

PORT PRINCE.—Light showers and intense frosts prevailed during the first half of the month, and vegetation made no progress. First almond blossoms appeared on 5th, about three weeks later than usual. Warmer weather and copious dews during the latter part of the month, and occasional heavy showers produced a rapid change favorable to vegetation. Wheat has stood out, and grass has begun to beat the stock. With the same favorable conditions continued during September and October there would be a better growth in the crops and grass than any year since 1894. Lamb-marking is nearly completed; the average is about 70 per cent. No floods have come down the Broughton this winter, the greatest rise being 5ft. Usually from one to ten 20ft. floods occur during the season. The intake of the Bundaleer and Fresh-water creeks to fill the Bundaleer dam has reduced our river by one-half.

PYRAP.—Showery at beginning of month, with fine warm weather since. Feed has made strong growth. Stock rapidly improving in condition. The rabbit-poisoning operations carried on before the rains have proved very effective.

RED HILL (August 26).—Enough rain has not yet fallen to fill dams or give the subsoil a soaking. Feed is very short and growing very slowly. Wheat on well-worked fallow is looking healthy, but backward; that manured with superphosphate shows much better than unmanured.

RICHMAN'S CREEK (August 22).—During the last week of July about 1in. of rain was recorded, and since the 15th inst. we have had a fall of 1½in. of good soaking rain. Dams have been replenished and the crops are already showing great improvement, more especially where fertilisers have been used. The feed is also coming on nicely. On the whole the prospects of the season are much brighter than they were a fortnight ago.

SADDLEWORTH (August 27).—Rainfall this month so far only half the lowest recorded during past twenty years; consequently grass very backward—probably a record season for absence of feed. Very little water has run this season, so that waterholes are still low. Wheat looks healthy where it has been drilled in with fertilisers. Ewes and lambs have had a hard time. Dairy stock are low in condition, and milch cows scarce. Rainfall this year to date, 9·24in.; average, 11·35in. to August 31.

STANSBURY (August 23).—Very favorable weather. Grass is becoming plentiful, and crops are looking well.

WALLOWAY.—During the past few weeks the weather has been almost all that could be desired, with the exception of a few severe frosts. With the aid of a thunderstorm and very heavy rain, all tanks and dams have been filled, and the ground has received a good soaking. These rains are considered the best for several years, over 2in. having fallen. The crops, though backward, are making vigorous growth. Feed for stock is still scarce, but on the average stock are in fair condition.

WANDERARH (August 27).—This month has on the whole been very favorable to crops and feed. It has been showery for the past fortnight, and in parts as much as 2in. have fallen. In places the crops are thin on account of the wheat not coming up properly, but generally they have made good progress. Feed is becoming more plentiful. Stock improving.

WILMINGTON (August 26).—The outlook is now most promising. The northern plains have not received such a soaking in August for many years past. To-day nearly an inch of rain has fallen, making over 4in. for this month. The wheat is making wonderful headway, and those who have used phosphate are more than satisfied. Grass, too, is growing very rapidly. There is now no doubt but that by the middle of September there will be a very heavy growth.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of August, 1901:—

Adelaide	1.19	Hoyleton	0.71	Macclesfield	1.87
Hawker	3.59	Baluklava	0.45	Meadows	2.85
Craddock	2.50	Port Wakefield	0.45	Strathalbyn	1.23
Wilson	2.51	Saddleworth	0.74	Callington	0.89
Quorn	2.78	Marrabel	0.69	Langhorne's Bridge..	1.05
Gordon	2.00	Riverton	0.68	Milang	1.10
Port Germein	1.66	Tarlee	0.49	Walleroo	1.17
Port Pirie	1.51	Stockport	0.69	Kadina	0.99
Crystal Brook	2.10	Hamley Bridge	0.44	Moonta	0.93
Port Broughton	1.73	Kapunda	0.89	Green's Plains	0.74
Bute	0.88	Freeling	0.71	Maitland	0.87
Hammond	2.47	Stockwell	1.34	Ardrossan	0.51
Bruce	2.35	Nuriootpa	1.22	Port Victoria	1.12
Wilmington	3.43	Angaston	1.26	Curramulka	1.28
Melrose	3.76	Tanunda	1.75	Minlaton	0.68
Booleroo Centre	2.97	Lyndoch	1.20	Stansbury	0.98
Wirrabara	2.41	Mallala	0.39	Warooka	1.15
Appila	2.94	Roseworthy	0.66	Yorketown	1.13
Laura	2.83	Gawler	1.41	Edithburgh	0.85
Caltowie	2.64	Smithfield	0.92	Fowler's Bay	2.09
Jamestown	2.48	Two Wells	0.49	Streaky Bay	2.22
Gladstone	2.35	Virginia	0.76	Port Elliot	2.36
Georgetown	2.17	Salisbury	0.85	Port Lincoln	2.88
Narridy	1.77	Teatree Gully	1.70	Cowell	1.44
Redhill	1.66	Magill	1.75	Queenscliffe	1.24
Koolunga	0.98	Mitcham	1.53	Port Elliot	1.60
Currieton	2.21	Crafers	3.13	Goolwa	1.26
Eurelia	2.56	Clarendon	2.06	Meningie	1.60
Orroroo	2.95	Morphett Vale	1.05	Kingston	2.59
Johnburgh	2.75	Noarlunga	0.75	Robe	3.03
Petersburg	3.07	Willunga	1.15	Beachport	2.41
Yongala	2.86	Aldinga	1.05	Bordertown	1.02
Terowie	2.78	Normanville	0.82	Wolsley	0.87
Yarcowie	2.19	Yankalilla	0.92	Frances	1.60
Hallett	2.36	Eudunda	0.82	Naracoorte	1.54
Mount Bryan	1.48	Truro	1.31	Lucindale	1.42
Burra	1.23	Mount Pleasant	1.37	Penola	1.95
Snowtown	1.06	Blumberg	1.65	Millicent	2.12
Brinkworth	0.75	Gumeracha	1.95	Mount Gambier	2.88
Blyth	0.79	Lobethal	1.61	Wellington	1.56
Clare	1.43	Woodside	1.95	Murray Bridge	1.12
Mintaro Central	1.06	Hahndorf	2.35	Mannum	0.45
Watervale	1.40	Nairne	1.89	Morgan	0.32
Auburn	0.98	Mount Barker	2.44	Overland Corner	0.70
Manoora	0.89	Echunga	2.21	Renmark	1.05

CENTRAL AGRICULTURAL BUREAU.

MONDAY, AUGUST 19, 1901.

Present—Mr. F. Krichauff (Chairman). Sir Samuel Davenport, K.C.M.G., Hon. A. W. Sandford, M.L.C., Messrs. W. C. Grasby, M. Holtze, R. Homberg, M.P., H. Kelly, T. B. Robson, C. J. Valentine, and A. Molineux (Secretary).

Membership of Central Bureau.

The CHAIRMAN referred in feeling terms to the loss sustained by the Bureau and the farming community generally in the death of Mr. Samuel Goode. Mr. Goode was an authority on farming generally, on stock-breeding, and on hop-growing. He was always willing to give farmers the benefit of his experience, and, when in good health, was a most regular attendant at the Bureau meetings. Other members also testified to their appreciation of the services rendered by Mr. Goode, and it was decided to send a letter of condolence to the family of the late member.

The CHAIRMAN also referred to the fact that Professor Lowrie would shortly cease to be a member of the Bureau. The Branches throughout the State had, with few exceptions, recorded their regret at his resignation, which was a loss, not only to the Bureau, but to the State generally. It was resolved that the Board place on record its deep regret at the resignation of Professor Lowrie.

Congress.

The SECRETARY reported that the Thirteenth Annual Congress would be holden in the Federal Hall, City Market Buildings, Grote Street, on September 10, 11, 12, and 13. The Hon. R. Butler, M.P., Treasurer and Minister of Agriculture, would open the proceedings on Tuesday evening, and sessions would be holden Wednesday, Thursday, and Friday.

Conferences of Branches.

Mylor Branch invited members of Central Bureau to be present at Annual Conference of Hills Branches on Thursday, September 26. Several members promised to attend.

Gumeracha Branch invited members to Conference of Branches to be held at Gumeracha on November 7 and 8.

Epp Wheat.

The CHAIRMAN said that Mr. A. Steinwedel had reported concerning Epp Wheat that he found it to be a late wheat, but this apparently was its only fault. It grew 2ft. 3in. high, had strong straw, and the knots were thick and at very short intervals. The grain was well held in the ears, the pistil short, and the pollen very large. Mr. Steinwedel had crossed it with one of his early varieties, and, as far as Mr. Krichauff could see, he had succeeded in raising early varieties, which he hoped would benefit South Australia.

San Jose Scale.

Mr. GRASBY called attention to a statement in a Victorian paper that the "existence of San Jose Scale had been frequently reported from South Australia," and inquired if the Secretary knew anything of the matter.

The SECRETARY stated that as soon as he saw the statement he wrote contradicting its accuracy, and asking for the authorities referred to. These were given, but were simply references to the original authority, the late Mr. W. M. Maskell, of New Zealand. Several years ago Mr. Quinn found a branch of

sugar gum growing in the Government House gardens to be affected by some scale insect new to him. He could find it nowhere else in the gardens. Specimens were sent to the late Mr Maskell, who replied that it was similar in many respect to, but varied in certain important particulars from *Aspidiotus perniciosus*. Later on, however, he referred to it in the Report of the New Zealand Royal Society as a species of *A. perniciosus*, and even then seemed rather dubious as to this classification. The affected parts of the trees in question were destroyed soon after the first discovery, and there had since been no signs of the scale on this or the adjoining trees. Under these circumstances, and in view of the fact that since then an indigenous and comparatively harmless scale exceedingly like the San Jose Scale, had been found in other parts of Australia, he thought they were justified in saying that South Australia was free from this dreaded pest.

Cider.

The SECRETARY tabled sample bottles of "Still Cider" and "Champagne Cider," manufactured by Mr. J. H. Foureur, of Lower Mitcham, from cull apples. The samples were tested by members, who differed in opinion as to the qualities of the cider. The "Still Cider" did not meet with complete approval, but several expressed favorable opinions of the "Champagne Cider." Some members were of opinion that the apples used were not of the right character, not being sufficiently acid.

Licensing of Stallions.

Murray Bridge Branch forwarded resolution asking the Central Bureau to urge on the Minister of Agriculture the necessity for legislation to provide for the veterinary examination and licensing of stallions offered for hire. It was resolved to forward the resolution to the Minister, and call attention to resolutions favoring action in this matter previously passed at the meetings of the Bureau.

Frost Affecting Wheat.

The CHAIRMAN directed attention to the fact that frosts had so badly injured the wheat crops in the eastern province of Prussia, that the Government of Prussia was supplying the farmers with seed, fodder, and fertilisers to enable them to continue their industry.

Branch at Ardrossan.

It was decided that, subject to suitable gentlemen being nominated as members, the Central Bureau would approve of the formation of a Branch at Ardrossan.

Discovery of Mineral Phosphates.

In reference to the discovery of mineral phosphates near Clinton, the Secretary reported that in December, 1896, Mr. Hawke, Secretary Artherton Branch, forwarded samples of soft rock obtained by Mr. Barton, stating that where it had been spread on the soil the vegetation showed the result. One sample was tested by the School of Mines at request of the Bureau, the analysis showing 6.69 per cent. phosphoric acid and 0.34 per cent. potash. Mr. Barton was asked for further information and the probability of deposits of commercial value impressed on him. The question of the search for phosphates was on several occasions discussed by the Central Bureau, and in August, 1897, a resolution was carried that "in view of the probability of deposits of potash or phosphates existing on Yorke's Peninsula, the Minister be asked to obtain a full report from the Government Geologist on the matter." Since that date the Bureau on several occasions has moved in the same direction.

New Members.

The following gentlemen were approved as members of the undermentioned Branches:—Burra, Mr. R. J. Needham; Lyndoch, Mr. J. W. Thomas; Tatiara, Messrs. H. L. Killmier and P. Lower; Swan Reach, Mr. J. Bolt; Mount Compass, Mr. H. McKinlay; Cradock, Messrs. W. J. Glasson, A. N. Graham, and G. Burt; Kanmantoo, Messrs. R. Downing and F. Hair; Bute, Messrs. H. Brideson and F. Trengove; Dawson, Mr. D. Giddings; Narridy, Mr. A. Rowe; Caltowie, Mr. F. Lehmann; Reeves Plains, Messrs. A. Modra, A. B. Jenkins, and H. Day; Mallala, Mr. Jas. Nairn; Quorn, Mr. C. A. Neindorf; Redhill, Mr. Chas. Brown; Richman's Creek, Mr. J. H. Lehmann, Mannum, Mr. W. H. Quartley; Boothby, Mr. A. A. Turnbull; Clare, Mr. A. P. Birks; Golden Grove, Mr. John Rawlings; Mylor, Messrs. J. Smith and F. R. Newberry.

Reports by Branches.

The SECRETARY reported receipt, since previous meeting, of ninety four reports of Branch meetings. With the exception of Norton's Summit, Tanunda, and Woolundunga, every Branch had reported meetings within past three months.

REPORTS BY BRANCHES.

Brinkworth, July 26.

Present—Messrs. J. Cross (chair), A. W. Morrison, H. J. Welke, H. Shepherd, W. Welke, and J. Stott (Hon. Sec.).

POULTRY.—A long discussion took place on poultry. Some members thought poultry-farming alone would not pay, but would be a good addition to the general products of a farm.

Johnsburg, July 27.

Present—Messrs. G. H. Dunn (chair), H. Napper, J. Sparks, J. R. Masters, F. W. Hombach, L. Chalmers, and T. Johnson (Hon. Sec.).

HAND-FEEDING OF DAIRY COWS.—Mr. Masters stated he had six cows in milk, five being fresh in. Owing to the scarcity of feed in the paddocks he had found it necessary to give them additional food or lose their milk. He had given them one feed a day, consisting of wheat chaff and 1qt. of crushed wheat per cow. The chaff was damped several hours beforehand and was fed in nosebags. Although not using a separator, he was making 30lbs. of butter a week. Mr. Chalmers was feeding wheat chaff, bran, and pollard to his dairy cows. He also had used copra cake occasionally, and thought it better than bran and pollard, though it made the butter unduly hard. Mr. Hombach was getting 5lbs. of butter per week per cow from cows receiving no other feed than that picked up in the paddocks; some of the cows had recently come in, while others had been in some time. Mr. Sparks had used copra cake with wheat chaff, but considered crushed wheat better. The Chairman fed his cows on damped chaff and crushed wheat, using nosebags, and giving each cow $\frac{1}{2}$ gall. of wheat daily. The results were satisfactory as regards both quantity and quality of butter produced. On fairly good salt-bush land the cows quickly fell off, and the flavor of the butter also suffered. He strongly recommended hand-feeding in this way when feed is scarce in the paddocks and previous to calving. He considered wheat much superior food to any other kind mentioned. The discussion elicited the fact that it paid better to feed wheat to dairy cows than to cart it to the mills and

sell at 2s. 3d. per bushel. Mr. Napper wished to know whether copra cake was better than linseed cake for keeping up the flow of milk. [The Dairy Instructor informs me that copra is the better food, both in regard to the flow of milk and the well-being of the cows.—GEN. SEC.]

VERMIN ON CATTLE.—A member said his cattle were much troubled by vermin. Mr. Napper suggested washing with warm water and soft soap, or even common soap, and then to rub them over with a cloth slightly moistened with kerosine. The kerosine must, however, be used very sparingly. [Mix one-half cheap vegetable oil, say teileseed, with the kerosine.—GEN. SEC.]

Mount Gambier, July 20.

Present—Messrs. J. Watson (chair), D. Norman, sen., W. Mitchell, M. C. Wilson, T. L. Browne, T. H. Williams, J. Dyke, D. Norman, sen., and E. Lewis (Hon. Sec.).

HORSE DISEASE.—Inspector Williams showed samples of about forty pea-sized stones taken from the bladder of a horse. The disease in this case was far too advanced for a cure.

CANCER IN CATTLE.—Inspector Williams said about three and a half years ago he had occasion to condemn a cow which was suffering from cancer, and she was taken to the kennels and destroyed. At that time she had a calf, and that calf had since developed cancer, and had had to be killed. About the same time he had had to destroy a cow in the hundred of Blanche because she had developed cancer. She also had a calf at the time she was destroyed, and a few weeks ago that beast developed cancer. In the district of Naracoorte, in February, he saw a beast with cancer, and a beast running with it at that time has since shown cancer. These three cases led one to believe, and went to support the stand taken, that cancer was a contagious disease. In reply to Mr. Mitchell, Inspector Williams said the cancer took the cattle in the same place in each instance—in the eye. The President asked the Inspector had not this experience led him to believe cancer was hereditary? The Inspector said he thought it was contagious. The cases he cited were a warning to anyone having cancerous beasts not to allow them to run with healthy animals. Flies no doubt carried the disease, and if an animal had the slightest inclination it would readily take it.

OFFICERS.—Office-bearers for past year were thanked. The following were then elected:—Chairman, Mr. W. Mitchell; Vice-chairman, Mr. J. Dyke; Hon. Secretary, Mr. E. Lewis.

Gradock, July 27.

Present—Messrs. R. Ruddock (chair), P. Gillick, W. H. Haggerty, J. H. Iredell, J. Paterson, J. Turner, T. Marsh, and J. H. Lindo (Hon. Sec.).

PROFESSOR LOWRIE.—Members expressed their regret that Professor Lowrie had decided to sever his connection with the Agricultural College and South Australia.

"THE FUTURE OF THE UPPER NORTH."—Chairman, referring to the above paper by Mr. Johnson, of the Johnsbury Branch, agreed in the main with it, but contended that the estimate of acreage required was too low. A farmer needed 10,000 acres to enable him to make a living in the dry areas. Mr. Gillick said some scheme like that propounded by Mr. Johnson is necessary to settle the question for the North. During the past few weeks five of the best and most practical farmers had left the district and gone to West Australia, and there were many others prepared to follow unless something is done to encourage them to remain in South Australia.

TYMPANITIS IN HORSES.—The Hon. Secretary and members generally disagree with the opinion of the General Secretary that it is not safe to give a horse water after it has been eating dry wheat. They believe that it is good to give the animal plenty of water and exercise when it has eaten dry wheat. A large tablespoonful of carbonate of soda in a quart of water is a good thing to administer in such a case.

Nantawarra, July 31.

Present—Messrs. J. Nicholls (chair), R. Nicholls, E. J. Herbert, A. F. Herbert, S. Sleep, G. Belling, R. Uppill, J. W. Dall, T. Dixon, jun., E. J. Pridham, and H. J. Spencer (Hon. Sec.).

PROFESSOR LOWRIE.—A resolution was carried expressing regret at the loss of Professor Lowrie's services.

HORSE COMPLAINT.—Mr. A. F. Herbert tabled correspondence *re* disease in young horses. The symptoms were described in November last and matter referred to the Chief Inspector of Stock, but nothing has been elicited to prove the cause of trouble.

GREEN FODDER.—Mr. Greenshields tabled King's Jubilee wheat in ear and 3ft. 6in. to 4ft. in height. He sowed three acres of hard and sandy land on April 5, applying 1cwt. of super. and 1½bush. of seed per acre. The crop on the sandy land was twice as good as on the rest. The second growth was 2ft. high. He thought an early wheat would be better than barley for green feed.

SHEEP ON FARMS.—Mr. E. J. Herbert read a paper on this subject to the following effect:—

Sheep on farms in this locality are a necessity. Sheep serve the purpose of an agricultural implement, cleaning the land which otherwise cannot be kept clean, as it will not stand the continual working which would be necessary. Every farmer who has 500 to 1,000 acres of land can keep a few sheep, say from 100 to 200, with great advantage to his land, besides the ready money they bring in each year. The farm must be divided by sheep-proof fences into small paddocks, so that all the feed can be utilised, and thus keep the paddocks intended to be fallowed well fed down, so that no weeds or grass are allowed to seed. After fallowing is done run the harrows over it; let the sheep do the rest until seed time. The pure Merino is the most suitable, as they do well with less feed than any other kind and do not trouble the fences. Always keep a young flock, saving a few of the best ewe lambs each year, and then either dispose of the same number of full-mouthed ewes, or, if there is fair feed after the remainder of the lambs are sent to market, keep the rams from them and they will soon pick up and make good meat for use on the farm through the winter. In selecting the ewe lambs to keep choose those with a dense and fairly coarse fleece, as the extra weight pays better than a better quality fleece and does not get so dirty. In drafting lambs some farmers put back a poor lamb into their flock, saying it is not good enough for market; but this is a great mistake, as if it has had the same chances as the others it must have a poor constitution and should be the first to go, for if it is not good enough for market it certainly is not a profitable sheep to keep. A farmer to use his sheep to the best advantage for his land cannot expect to have fat sheep; therefore he thinks ewes and lambs are the most profitable to keep. A ewe lamb during four years will bring in about £2 7s. 10d. in cash, and leave a good 2-tooth ewe to take her place. A lamb dropped in April will cut about 4lbs. of wool at 5d. per pound, 1s. 8d.; at 2-tooth, 9lbs. at 6d. per pound, 4s. 6d.; at 4-tooth a lamb worth 7s. 6d. and cuts 9lbs. of wool at 6d. per pound, 4s. 6d.; at 6-tooth has a lamb to be kept and cuts 9lbs. wool at 6d. per pound, 4s. 6d. The lamb kept cuts 4lbs. of wool at 5d. per pound, 1s. 8d.; at 8-tooth has a lamb worth 7s. 6d.; cuts wool worth 4s. 6d. The hogget kept cuts 9lbs. at 6d. per pound, 4s. 6d.; then sell the old ewe for 7s.—making the total income £2 7s. 10d. By keeping ewes and lambs the flock is largest when feed and water are plentiful. Then send the lambs to market; sell some of the full-mouthed ewes, so there are fewer to be kept when feed and water are scarce. By working on this principle you always have a young flock. Old sheep do not do as well as young sheep on little feed. The same grass that keeps an old sheep only worth 5s. will just as well keep a young one worth 10s. or 12s.

Mr. Herbert's estimate of a gross annual income from well-managed sheep at 10s. a head was considered fairly accurate. Mr. Dixon said a good ewe mated with a Shropshire ram should produce a lamb that would bring not less

than 10s. in the market. This subject will be dealt with in another paper, and the question of feeding hay to sheep to tide them over a period of scarcity will be dealt with. Mr. Herbert explained that the object of his paper was to show how sheep should keep the farm, and not the farm keep the sheep. If he were engaged in sheep-farming pure and simple he would of course adopt different methods.

Ororoo, July 26.

Present—Messrs. W. S. Lillecrapp (chair), J. Moody, M. Oppermann, W. Robertson, R. Coulter, jun., E. Copley, J. Scriven, and T. H. P. Tapscott (Hon. Sec.).

WORMS IN PIGS.—Two members asked for cure for worms in pigs. The Hon. Secretary stated he had recently killed a young pig and found several worms 6in. to 10in. long and tapered at both ends. Mr. Moody suggested giving the pigs a little sulphur, while Mr. Robertson recommended a small allowance of copra cake daily as a good thing for pigs.

Stockport, July 30.

Present—Messrs. D. G. Stribling (chair), C. W. Smith, T. Megaw, W. Barker, T. Hogan, J. Murray (Hon. Sec.), and one visitor.

STUBBLE-BURNING.—Mr. C. W. Smith read a paper on this subject to the following effect:—

He believed stubble-burning was a mistake. Those of us who have been cultivating the land in this district for twenty years or more, especially where it is somewhat hilly, cannot fail to have noticed that the soil is becoming thin in many places compared to what it was years ago. This was largely caused by heavy rains. Every time the harrows or cultivator pass over the land there is a tendency to shift the soil lower down the hill, but never uphill. Heavy winds also remove a great quantity of soil from the tops of the hills. The question arises, "Can anything be done to prevent or in some way make up for this loss?" He thought there was, to some extent, at least. He believed that on an average there was half a ton of vegetable matter to the acre left on the ground after the stripper has passed over. This is in the shape of straw, stinkwort, and other weeds. There is no labor for carting and spreading to be taken into account; the material has simply to be ploughed in at fallowing, and could not fail to make up somewhat for the loss referred to, as, when it decays, this vegetable matter makes soil. Then a great deal of our land sets down so hard after fallowing that it is impossible to work it to any profit; it seems to form a surface that is almost watertight, so that the early rains cannot penetrate, and no benefit is possible from the air or atmospheric action. This would be partly remedied by ploughing in the stubble, as the land would remain open and so receive the full benefit of the rains—a most important point in this dry climate.

Mr. Megaw thought it was beneficial to burn the stubbles; the feed was always better, though he could see no difference in the following crop. Mr. Hogan considered it wasteful to burn stubble; it ought to be gathered and stacked for feeding to stock in winter time, chaffed and mixed with treacle or copra cake. Mr. Stribling found it difficult to work the land with a lot of straw on it. Mr. Smith wished to know whether there were any fertilising properties in straw, and did the land benefit from turning it under? [There is certainly some fertilising property in straw if turned under. The main benefits, however, would be that the land would be kept more open, and the decaying straw would add more humus to the soil, enabling it to hold more moisture and make better use of the plant food in the ground. On the other hand, in many instances, the straw would not decay quickly enough, and the ground would be too open for the following crop. The question as to whether ploughing the straw under is beneficial will largely depend upon the soil, rainfall, and use to which the land is to be put.—GEN. SEC.]

Lyndoch, August 1.

Present—Messrs. H. Kennedy (chair), W. Rushall, W. J. Springbett, H. Springbett, M. Burge, P. Zimmermann, B. Ren, and J. Murray (Hon. Sec.).

ANNUAL REPORT.—The Chairman reported on work done by the Branch during the past year. Votes of thanks were accorded to the retiring officers, and to Mr. D. Nicholls for allowing use of room for meetings free of charge. Messrs. H. Kennedy, W. J. Springbett, and J. Murray were re-elected Chairman, Vice-chairman, and Hon. Secretary respectively.

VINEYARD CULTIVATION.—The Chairman and Vice-chairman were appointed to meet delegates from Angaston and Tanunda Branches to arrange matters in connection with prizes offered by Mr. B. Seppelt and the Adelaide Wine Company for the best cultivated vineyards.

VISITS OF INSPECTION.—It was decided to endeavor to arrange for members to pay visits of inspection to the Roseworthy Agricultural College, and to Mr. Alex. Murray's homestead at Mount Crawford.

Bute, June 25.

Present—Messrs. H. Schroeter (chair), J. H. Barnes, A. Schroeter, W. A. Hamdorf, W. H. Sharman, R. Commons, M. Stevens, E. Ebsary, S. Trengove, and A. Sharman (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary's annual report showed that during the year nine meetings had been held, with an average attendance of ten members and five visitors. Mr. W. A. Hamdorf was elected Chairman, and Mr. A. Sharman re-elected Hon. Secretary for ensuing year.

Appila-Yarrowie, July 26.

Present—Messrs. P. Lawson (chair), J. C. W. Keller, A. Fox, J. Wilsdon, J. H. Bottrall, N. Hannagan, J. Daly, J. H. Klemm, W. C. Francis, R. H. Grant, G. A. A. Becker, and C. G. F. Bauer (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary's annual report showed that during the year eight meetings had been held, the attendance averaging over eleven members at each meeting. A new departure was undertaken, *i.e.*, the holding of a show of home products and industries, with fair success. Only one paper was read during the year, and one homestead meeting held. He hoped during the coming year there would be an improvement in both directions. Visitors to their meetings had been few in number, probably owing to the public being unaware that the Bureau meetings were open to visitors. A vote of thanks was accorded to the officers for their services, and they were re-appointed for the ensuing year.

Port Pirie, July 27.

Present—Messrs. P. J. Spain (chair), H. B. Welch, T. Johns, T. Gambrell, T. Jose, F. Humphris, G. Hannan, W. Smith, J. Lawrie, G. M. Wright, and T. A. Wilson (Hon. Sec.).

WEED.—Mr. Smith tabled weed with small pea-shaped reddish flowers and pods about $\frac{1}{2}$ in. to 1 in. in length. It was spreading freely in the neighborhood of his farm. [This is a native plant, most probably *Lotus australis* var. *parviflorus*. Allied species have at times been responsible for stock losses, while, on the other hand, it is quite common for *L. australis* to be eaten by

stock without injury. Like a good many other plants, the effect will depend partly upon the condition of the animals eating it and the maturity of the plants.—GEN. SEC.]

SEA SHELLS FOR MANURE AND FOR STOCK.—Mr. Spain directed attention to practice adopted in Salisbury district of applying shells from the beach [shell sand it is usually called.—GEN. SEC.] at rate of two wagonloads per acre on heavy soils. The result was quite equal to superphosphate, especially on the second crop if the land is fallowed. Other members spoke of their usefulness for mixing with damp super. to make it run through the drills freely. [It is a common practice in many localities within easy reach of the sea to make use of shell sand on heavy soils. The shells contain a large percentage of lime, which not only makes the soil more friable and releases or makes available to the plants the food that is in the soil, but also acts directly in stimulating plant growth. Crushed and burnt limestone is used in similar manner. When mixing with damp super. care should be taken to keep the mixture dry and not to allow it to stand too long before using.—GEN. SEC.] Mr. Lawrie referred to the value of this shell-sand for poultry and pigs. Mention was made of the fact that large deposits existed on the beach towards Port Germein.

Kanmantoo, July 25.

Present—Messrs. J. Downing (chair), W. Mills, J. Mullins, and A. D. Hair (Hon. Sec.).

MANURES.—Some discussion took place on the use of manures for cereal crops. Members were of opinion that much depended upon the soil manured; some land would take a much larger quantity than others with profit. What would cause the crop to blight on one soil would not have this effect on others. Mr. Mills applied 1½ cwt. of super. per acre on sandy land last year, and got no better return of grain than from land treated with 1 cwt. per acre. As a hay crop, however, the heavier dressing would have given an increased return. Another member had noticed that heavy dressings of sheep manure caused the crops to blight, the crops on old sheep camps suffering in the same way. He would like to know why this should be. [The crops blight because they have been forced into too vigorous or rank growth by excessive manuring. Any animal manure applied to excess will have the same effect in this climate.—GEN. SEC.] Members were of opinion that the land was not suitable and the rainfall too uncertain for extensive manuring for grazing purposes.

Koolunga, July 25.

Present—Messrs. T. B. Butcher (chair), J. Button, J. Sandow, G. Cooper, W. T. Cooper, R. Lawry, R. H. Buchanan, and J. C. Noack (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary's annual report showed that twelve meetings, one being a homestead meeting, had been held, with an average attendance of nine members. Visitors had not been as numerous as could be desired. Seeds from Central Bureau had been carefully tested and products tabled. Mr. Noack urged the necessity for members taking it in turn to write a paper or initiate a discussion at the meetings. The retiring officers were thanked and re-elected.

AGRICULTURAL PLOTS.—Messrs. G. Pennyfield and J. Button won the handsome framed pictures offered for best agricultural plots in the district.

WATERING HORSES.—Mr. G. Cooper answered the question "Is it safe to water horses after eating wheat?" in the affirmative. He said watering would prevent or mitigate inflammation, and help to move the wheat. Injections were also helpful.

Wilmington, July 29.

Present—Messrs. A. Maslin (chair), T. H. Harris, J. Schuppan, J. McLeod, H. Noll, J. Lauterbach, R. G. S. Payne (Hon. Sec.), and one visitor.

PROFESSOR LOWRIE.—A motion expressing appreciation of the valuable services rendered by Professor Lowrie, and regret at the loss sustained by the State by his resignation, was carried.

ARTIFICIAL FEEDING OF SHEEP.—Mr. Noll read an instructive paper on the question of feeding sheep by hand to tide them over periods of scarcity. He divided a flock of ewes, putting 130 into an enclosure of a few acres, and 100 in a stubble paddock. He constructed shallow bins for holding chaffed hay for feeding at the rate of 1lb. of chaff per sheep per day. The sheep confined in the smaller area did much better than those with a larger run. The whole lot soon began to improve in condition, the result being that he saved all the ewes and most of the lambs. In two months the 230 ewes consumed 7 tons of chaff, which at market price was equal to 1s. 8d per sheep for two months' feeding. He found that wheaten hay with much grain in the heads was not so beneficial. An interesting discussion followed the paper.

Dawson, August 3.

Present—Messrs. R. Renton (chair), P. J. Byrne, C. W. Dowden, O. Muller, J. H. L. Severin, A. F. Dempsey (Hon. Sec.), and one visitor.

WORK OF BRANCH.—Considerable discussion took place on correspondence from General Secretary *re* absence of reports from Branch. The difficulties experienced during the past few years, owing to the severity of the seasons, and the impossibility under present conditions of doing anything at Bureau meetings were referred to. Members fully appreciate the benefits of the Bureau, and regret that they are unable to take a more active share in the work. It was decided that the question of closing the Branch be allowed to remain in abeyance pending alteration for better or worse in the prospects.

SPEYING COWS.—Mr. Dowden asked whether there was anyone living within easy distance of this district who was competent to spey cows. He had lost so many cows of late through troubles at calving that he believed it would pay to avoid such risks in future and spey the cows.

SEASON.—The rainfall for the year to August 3 has totalled only 2'3in., of which nearly half fell in July. The country is in a terribly bad state, there being no feed of any sort in the paddocks. The wheat on the freer soils is just over the ground, but on the clay patches it is even poorer. Most residents are away trying to earn food for their families and stock. No more important subject can possibly engage the attention of Parliament than the question of what to do for the settlers on the fringe of the agricultural areas. [Splendid soaking rains have since been recorded throughout this district.—GEN. SEC.]

Hahndorf, August 3.

Present—Messrs. F. H. Sonnemann (chair), M. C. Bom, C. Jaensch, P. Schubert, H. Spoehr, H. Kerr, J. C. Rundle, and D. J. Byard (Hon. Sec.).

PROFESSOR LOWRIE.—A motion was carried expressing regret at the resignation of Professor Lowrie, and recording the appreciation of the members of the value of his services to the State.

HILLS CONFERENCE.—Delegates were appointed to attend Conference of Hills Branches, to be held at Mylor on September 26.

WORK OF BRANCH.—Considerable discussion took place on letter from General Secretary re work of Branch. It was resolved the members make it a point of attending as regularly as possible, and those who have repeatedly been absent from meetings be reminded that their seats may be declared vacant.

CODLIN MOTH.—Some discussion on this subject took place. Several members have been conducting experiments with view to gaining information concerning the natural enemies of the pest. Mr. Sonnemann had purposely left bandages on the trees through the winter, and on removing them had in many cases found scorpions and centipedes in the folds, and traces of caterpillars that had been destroyed, presumably by these animals. Where there were no scorpions or centipedes in the bandages the caterpillars were numerous. He had also put matured caterpillars in a bottle in which he had placed a centipede and in every case the caterpillars were devoured. [If he had placed two centipedes, or two scorpions, or two spiders, or the whole of the above in a bottle he would have found that they would kill and eat each other till only one was left.—GEN. SEC.]. The chrysalides in the cocoons were not touched. Mr. Kerr spoke of the fondness of the black ants for the caterpillars, and regretted that they were driven out of the orchard by cultivation of the ground. Mr. Sonnemann said it was impossible to do away with all the harbor on old trees: he had used moth traps baited with apple jam, but found twenty other moths to every codlin moth. Mr. Spoehr said it was simply impossible to eradicate the pest on trees near a post and rail or even post and wire fence. Mr. Jaensch contended that means for fumigating or steaming fruit cases should be provided at the markets, and a small charge made to cover expenses.

Gumeracha, August 5.

Present—Messrs. D. Hanna (chair), W. Cornish, W. A. Lec, W. Jamieson, J. R. Stephens, A. E. Lee, W. V. Bond, J. Monfries, J. Kitto, and T. W. Martin (Hon. Sec.).

BRANCH CONFERENCE.—It was decided to hold a Conference of Branches at Gumeracha on November 7 and 8. Arrangements will be made to take visitors round the district to inspect places of interest.

Scales Bay, July 19.

Present—Messrs. A. Newbold (chair), J. J. Roberts, R. S. Thomas, E. R. Aitchison, and D. P. Thomas (Hon. Sec.).

RABBIT DESTRUCTION.—Mr. R. S. Thomas favors phosphorus for poisoning rabbits. [The methods for preparing poisoned baits for rabbits, &c., was published in the July, 1901, issue of *Journal of Agriculture*.—GEN. SEC.]. He dropped the pellets along a fresh plough furrow. Mr. Aitchison said many people take care to fill up all burrows before they laid the baits. This was a mistake, because if the holes are left open the rabbits go into the burrows to die, and the carcasses are out of the way of pigs and other animals which might be poisoned by them. Mr. Roberts had used arsenic with marked success, and described preparation as recorded in our July *Journal*. Mr. Newbold thought poison was not of much use when there is plenty of grass and wheat plants about. The most effective way was to get all dogs available, hunt the rabbits into their burrows, if they cannot be caught, and destroy them there. The Hon. Secretary said any poison that was made attractive would do, but the the variety must be changed weekly—say, phosphorised pollard, then toxa, then arsenic, and so on. Where stock are running the poisoned baits should

be covered by putting down two posts or logs side by side, about 4in. apart, with sticks laid across, then covered with bushes, so that rabbits can run beneath but cattle, sheep, &c., cannot get at the poison.

MICE.—Mr. Aitchison had found phosphorised pollard effectual in destroying mice. Mr. Roberts had been successful with Battle's vermin-killer. He had also used strychnine and beef dripping for killing mice in stacks of wheat in bags. [A most dangerous practice.—GEN. SEC.]

Reeves Plains, August 6.

Inaugural Meeting.

Present—Messrs W. H. George, H. Day, J. G. Folland, J. Dawkins, W. Day, and J. J. McCord.

WORK OF BRANCH.—Messrs. W. H. George, J. G. Folland, and J. J. McCord were elected Chairman, Vice-chairman, and Hon. Secretary respectively. Additional members were nominated for approval by Central Bureau, and arrangements made for future meetings. Papers on "Jersey Cattle," "Poultry," and "General Farming" were promised by different members.

Arthurton, July 25.

Present—Messrs. W. H. Hawke (chair), W. Lomman, W. Short, J. Koch, W. E. Hawke, T. Baldock, H. J. Freeman, S. T. Lamshed, J. Welch, J. B. Rowe (acting Hon. Sec.), and two visitors.

ALLEGED CURE FOR IMPACTION.—Mr. Hartley, of Bute, forwarded particulars of his treatment for cattle suffering from acute indigestion, impaction, etc., together with formula or recipe for the condiment to be used.

THIN V. THICK SEEDING.—The Chairman read a paper to the following effect:—

He considered this to be a most important subject for investigation. The advocates for thin sowing mostly conducted farming in localities where there is usually a scanty and unreliable rainfall, whilst those who recommend thicker seeding are resident in areas where the rainfall is more assured. Perhaps both parties are justified in their contentions. No doubt climate is a most important factor in determining the quantity of grain it is possible to grow on an acre of land, and probably it requires a fair amount of seed to secure a big crop. He had heard or read that Meehi got a return of fourteen bags of wheat from 1qt. of seed. Mr. Coleman was reported to have realised 109bush. per acre, and he (the Chairman) had grown at the rate of 40bush. of wheat per acre from 10lbs. seed per acre, but the conditions were all in favor of a good yield. The land had been subsoiled the year before, and was in good condition as to plant food; the seed was hand-thrashed, was of good tillering habit, evenly distributed in drills, and twice cultivated with the wheel hoe. This, with a 20in. rainfall, gave the seed a good opportunity of showing what it was capable of doing; several of the rows returned four hundredfold. Now, however fertile the land or how well prepared, if there is little or no rain there will be little or no crop. In this locality the rainfall has on several occasions been as low as 12in. for the year, and if any farmer gets an average of four bags per acre under such conditions it is proof that he has done good work. To get this result would require 30lbs. of good, clean, uncracked seed of Ward's or Purple Straw, of tillering habit, drilled in with 1wt. of super., on well-prepared fallow, in the beginning of May; or 45lbs. to 50lbs. of an early variety, such as Steinwedel or King's Early, similarly treated, and sown by the end of May, will be ample, but where there is an assured rainfall of 20in. to 25in. per annum a much heavier crop can be expected, and more seed may be required, especially as some of it may rot. The question, however, is affected and determined by many other conditions, which may be considered in the following order:—

Variety of Wheat.—It is well known to the farmers that there is a vast difference in the tillering habit of different varieties of wheat. Early sorts, typified by Steinwedel, make few stems per plant. On the other hand, later varieties, such as Dart's Imperial, produce many heads per plant; in fact, this constitutes, or rather causes, the difference between early and late

varieties, the former running up to head quickly, whilst the latter spends the first three or four months of its existence in lying about on the ground and producing numerous stems: Therefore I think I am safe in saying that 30lbs. of a late variety will produce as thick a crop as 45lbs. of an early one.

Time of Sowing.—Most farmers will agree that considerably more wheat is required if sown late, to give an equally thick crop, to what is required if sown early. It must be understood that the land is in a fit condition as to moisture to bring the crop up at once; otherwise, as was the case this year when some of our wheat laid dormant in the ground for seven or eight weeks, June sowing was better than May, as I will explain later on. My practice has always been to sow late varieties first and early sorts last. In the broadcast age I usually commenced about 1st of May with 40lbs. of, say, Purple Straw, and finished off with 60lbs. of Steinwedel early in June, or, if much later, I have put on as high as 75lbs. of Steinwedel per acre. With the drill this year I began with 40lbs. of World's Champion (the seed was broken somewhat), and finished early in June with 55lbs. of King's Early.

Condition of Seed.—If stripped in hot weather, and the machines driven fast, I believe quite 50 per cent. of the wheat will be damaged, and if a majority of the grains come up a considerable number of plants will be so much later than others that in the struggle for existence they will be either entirely wiped out, or at best give a very poor return. Several years ago I planted out 100 apparently undamaged grains pickled with bluestone, and 100 grains pickled with Clarke's carbolised mixture. In fourteen days thirty-nine of the former were up, and forty-six of the latter. Eventually about seventy-five in each hundred came through the ground, but some were three months in doing so, and stood no chance against the strong plants that came up early. I believe 60 per cent. is quite high enough to reckon ordinary stripped wheat as likely to be effective for seed purposes.

Market for Hay.—With a rainfall that may be as low or even lower than 12in. it is not safe to cater for a heavy crop of straw, but if you have a good market for hay, or hay chaff, and the land is fit for working a binder, and doing good work (not leaving half the stuff on the ground), then you can cut your crop for hay if it be blighted owing to insufficient moisture to mature it, and it may pay you to run the risk, especially as, given a good year, you may get a heavy crop of wheat.

How long Seed has been Pickled.—I have used for past twenty years $\frac{1}{2}$ lb. of bluestone per bag of seed with good results. This is not an excessive amount, and, as I believe, less than the majority of farmers in South Australia use; yet, with this light dressing, I find that where I used some seed left over from last year the crop is not more than one-third as thick than on either side of it, notwithstanding that the old seed, being perfectly dry, would run freer. And further, I notice that the wheat that was drilled in early this year, and laid seven weeks without coming up, is perceptibly thinner than that which only laid a week or so in the ground before germinating, although the same quantity of seed was used throughout.

In conclusion to briefly summarise. The factors determining the quantity of seed wheat to use per acre are climate, variety of wheat, time of sowing, condition of seed, market for hay, length of time wheat has been pickled, and probably numerous others affecting different localities; and I think that a grower must first decide how heavy a crop his land is capable of maturing with the ordinary rainfall, and seed accordingly.

Pine Forest, July 23.

Present—Messrs. J. Phillis (chair), A. Mudge, W. H. Jettner, F. Bayne, J. Flowers, R. Barr, jun. (Hon. Sec.), and two visitors.

WHEAT-EATING HORSES.—When horses have gained access to wheat heaps and have gored themselves they become bloated, and will die unless speedily treated. Mr. Mudge advised letting them drink freely of water, then give a tablespoonful of carbonate of soda in a quart of water. Mr. Bayne would let them drink as much water as they wanted, then hurry them about briskly to scour them. He had averted bad results by this treatment. Mr. Jettner had twenty horses once which had got their fill of wheat, and dosed them with oil and new milk—a bottle of oil and a bottle of new milk to each horse—with complete success.

CALLUS ON WORKING HORSES.—When these appear on the shoulders Mr. Phillis would use the knife. Mr. Mudge would use a lotion, made by mixing a tablespoonful of saltpetre in a pint of vinegar, which quickly removes the excrescence without disfigurement, as is the case where the knife is used.

SHEEP ON FARMS.—All members were agreed that sheep are never out of place, even on the smallest farm. The expense of sheep-proof fences is the only reason why any farmer fails to keep sheep in this locality, as their advantage and profitableness is apparent to all.

FERTILISERS.—Members variously estimated the increased carrying capacities of the land since the practice of manuring commenced at from 50 per cent. to 100 per cent.

PRICES OF LAMBS AND MUTTON.—Members think it is anomalous that best Australian lamb and mutton sold in London should be 3d. per pound, whilst an inferior quality of the same should be sold locally at nearly treble the price.

FEEDING SHEEP ON CHAFF.—When natural herbage is scanty it is wise to feed on chaffed hay, especially to ewes and lambs. Feeding with cocky chaff has proved most successful in such cases.

CATTLE COMPLAINTS.—The Chairman had lost four cows, which he thought was caused by eating stinkwort. For tympanitis, or bloat, or hoven it was recommended to give a tablespoonful of carbonate of soda in a quart of water.

Quorn, August 1.

Present: Messrs. R. Thompson (chair), F. Herde, Jas. Cooke, C. Patten, W. Toll, H. Altmann, J. B. Rowe, G. Walker, J. Brewster, A. F. Noll (Hon. Sec.), and one visitor.

PROFESSOR LOWRIE.—A resolution expressing appreciation of the services of Professor Lowrie and regret at his removal from the State was carried.

Eudunda, August 5.

Present:—Messrs. J. von Bertouch (chair), J. A. Pfitzner, C. Wainwright, F. W. Paech, M.P., H. D. Weil, and W. H. Marshall (Hon. Sec.).

POULTRY.—On July 31 Mr. W. B. Wyllie, of Kapunda, gave a very instructive address on poultry-keeping. Last year his eggs only cost 2½d. per dozen, and the fowls returned a profit of 10s 8d. each per annum. He used the incubator for hatching, and the cost of eggs and kerosene averaged 1d. per chick. At ten weeks old the chicks had cost 5d. each; they had had as much as they could eat, but nothing was allowed to waste. These results were only obtained by most careful attention, regular feeding, selection of feed, and scrupulous cleanliness being essential to success.

POISON PLANTS.—Mr. Weil mentioned that during the past few months several farmers in the district had lost a number of head of stock from some unknown cause. The Hon. Secretary suggested poison weeds as a probable cause. Some time ago he had offered to obtain the names of suspected poisonous plants if the farmers would gather them. They could be properly labelled and exhibited in a public place for the information of landowners. It was decided to write to the local council asking that noxious and poisonous weeds be destroyed.

Morgan, August 8.

Present—Messrs. R. Windebank (chair), C. W. F. Pfitzner, G. Schell, A. F. Heinrich, G. Wittwer, G. Ruediger, and E. French (Hon. Sec.).

RABBITS.—Some members consider the torpedo rabbit exterminator too costly whilst phosphorised pollard is available; but others think that the latter is too dangerous, because it also kills so many stock and valuable birds. [Such as crows, magpies, larks, plovers, &c.—GEN. SEC.]

ANGORA GOATS.—Mr. G. Wittwer made a few observations on Angora goats to the following effect :—

For the past six or seven years there had been a drought in the district, and neither wheat-growing, nor breeding of horses, cattle, or pigs, had been profitable. A little better result had been got from sheep. Now, he thought Angoras might pay in this district better even than sheep, because they are hardy and give two clips of valuable mohair each year. The hair is long and silky, and is used in the manufacture of textile fabrics known chiefly as mohair. The skins are used in making fine leathers for bindings, for gloves, purses, and many other articles, and the flesh is a good deal like mutton, whilst the milk is rich and can be used for the manufacture of butter and cheese. The high-class bucks and does are rather costly, but by careful breeding and selection a valuable herd of high-class animals could be got together within a comparatively short time.

Many members believe that Angora goats will in time become a valuable source of income to farmers. They need a substantial fence; but when once secured all the cost and trouble will be more than repaid. Their skins, mohair, flesh, milk, butter, and cheese, are all saleable, and they are capable of living where other farm stock cannot exist.

Richman's Creek, July 29.

Present—Messrs. W. Freebairn (chair), A. Knauerhase, J. M. Kelly, E. Roberts, P. J. O'Donohue, J. McSkimming, F. Mattner, and J. McColl (Hon. Sec.).

POULTRY.—Mr. Kelly read paper from N.S.W. *Agricultural Gazette* on incubation, and some discussion followed. Mr. Kelly had used an incubator with fair success in hatching, but a number of chicks were weak, and he found it difficult to rear them. It was most important that the incubator should be kept at a regular and correct temperature. Mr. Knauerhase said it paid handsomely to feed wheat to fowls at present prices, provided the birds received proper attention.

Yankalilla, August 8.

Present—Messrs. E. C. Kelly (chair), J. Tonkin, J. Gardner, W. H. Leverington, A. Mayfield, Alex. Wood, H. J. Dennis, and G. H. McMillan (Hon. Sec.).

RABBITS.—Mr. J. Gardner said this subject was of urgent importance to every occupier of land. Rabbits had increased to a great extent lately, and he thought would soon overrun the district if prompt measures were not taken to keep them in check. It was unanimously resolved to direct the attention of the district council to the matter, and recommend strict enforcement of the Vermin Act without delay. Members also recommend the removal of prickly pear hedges, gorse fences, and other cover.

Redhill, July 30.

Present—Messrs. R. T. Nicholls (chair), A. A. Robertson, W. Stone, R. H. Siviour, A. McDonald, H. Darwin, D. Steele, and J. N. Lithgow (Hon. Sec.).

FIFTY YEARS' IMPROVEMENTS ON FARM IMPLEMENTS.—Mr. D. Steele dealt with this subject. Fifty years ago the wooden swing plough, with short mould board, was used; then came iron wheel-ploughs, followed by multiple ploughs with many furrows. The greatest improvements had been made with mowing machines and binders. One of the first mowing machines required five men to work it, and then scythes had to be used whilst the mower was under repair. During the half century nearly every class of implement and machinery

had been improved. In discussing this all members agreed with Mr. Steele; but some favored disc implements, though they admitted a need for improvement. A newly-introduced harvester it was thought would become largely used if the price were reduced; and it was hoped that less importation of machinery, etc., would be prevented by having such manufactured in the State. Mr. Robertson quoted an account of a form of stripper used on the plains of Gaul during the fourth century. [The account has often been published—GEN. SEC.] He also said it was estimated that in 1885 it occupied four and a half hours of human labor to produce a bushel of corn, but in 1894 only forty minutes. In 1860 it occupied thirty-six hours in the production of a ton of hay, and in 1890 only eleven and a half hours.

Holder, August 3.

Present—J. Rowe (chair), F. Starr, J. Green, F. G. Rogers, H. J. Rossiter, C. H. Perry, W. Wood, H. Blizard, and J. J. Odgers (Hon. Sec.).

SEEDING OPERATIONS.—Mr. Rogers initiated a discussion on best machine for putting in wheat in this district. There were two classes of soil to deal with, lagoons and light sandy land, and each require different treatment. For the sandy soil a stump-jump plough was best at first, as it clears the country; afterwards he would use disc-harrows, as they do equally good work in quicker time. Members considered that the disc-harrow had too many castings, and gave preference to the Massey-Harris cultivator.

Mount Pleasant, August 9.

Present—Messrs. J. Phillis (chair), W. Lyddon, J. F. Miller, P. Miller, jun., H. Drogemuller, S. A. Vigar, and F. Thomson (acting Hon. Sec.).

TYMPANITIS IN COWS.—Mr. S. A. Vigar had a cow bloated on one side after calving. On stabbing the part with a knife the air escaped, but the cow has not yet regained her usual health.

LICENSING STALLIONS.—All members agreed that entire horses used for hire should be examined by a competent authority, and, if found to be sound and fit, should then be licensed. Mr. Vigar prefers lighter horses than are generally used on farms.

RAINFALL.—For July, 2.22in.

CROPS.—Crops are backward, and live stock low in condition.

Gladstone, August 2.

Present—Messrs. W. A. Wornum (chair), J. H. Rundle, G. M. Growden, J. Shepherd, J. King, J. Burton, D. Gordon, W. Brayley, E. Coe, J. Milne, J. R. Smallacombe, S. C. Goode (Hon. Sec.).

FRUIT-GROWING.—Mr. W. A. Wornum read the following paper:—

Introduction.—I think the subject of fruit-growing may fairly claim attention, as its growing importance should be apparent to all those working the land.

Climate, &c.—The climate of South Australia has been proved suitable for the production of almost all kinds of fruit: many varieties grow to great perfection, where there is a fair rainfall. The quality of fruit grown in many parts of the north is excellent, and more should be grown locally when good fruit is looked upon by many people as a luxury. Fruit fresh from the garden is always to be preferred to that obtained from shops or hawkers' carts, being better flavored and more wholesome when picked just at the right stage. The proper degree of ripeness can generally be ascertained by the color, feel, or flavor.

Fruit-growing Centres.—In parts of the south, and in districts like Angaston and Clare, fruit-growing is one of the chief industries; but in parts of the north along the Flinders Range, viz., Wirrabara, Laura, Beetaloo, and Napperby, fruit trees do well. If at such places fruit-growing centres were established a larger quantity of fruit of a uniform sample would be available for export.

Co-operation.—I should like to see some form of co-operation adopted, so that small growers could combine and forward consignments to the Produce Dépôt for shipment; and even for the disposal of produce in our local markets, a system of combination would be beneficial.

Constant Supply.—To have a constant supply of fruit all the year round, might also be possible, beginning at the new year with the many varieties then in season we can go on with grapes, late varieties of apples and pears, oranges, loquats, strawberries, cherries, early peaches and apricots, to say nothing of dried fruit—raisins, apricots, prunes, &c., the demand for which is as yet far from satisfied.

Selection of Site, &c. In selecting a site for an orchard get one near the house if possible; if not, choose the next best place, taking the quality of the soil, the aspect, and general convenience into consideration. In regard to the situation of an orchard an eastern aspect is always to be preferred; the reason for this preference is that the eastern side of a hill receives the earliest rays of the sun before they have acquired any great amount of heat, and the dew on the trees is therefore slowly evaporated; and, as evaporation always causes cold, the more slowly the dew is driven off the less risk there is of the tender blossoms being blighted: while, if the aspect be a western one, the sun will be high before its rays can reach the trees, when its greater heat will cause a more rapid evaporation and a proportionally greater amount of cold, whereby the risk of blighting is greatly increased. It has been observed that the finest fruit is generally found on the east side of a tree. In most places it will be found necessary to have the orchard enclosed with wire-netting to keep out all rabbits, hares, &c.

Cultivation and Planting.—The whole should be ploughed to a good depth, or, better still, fallowed. The land where the rows are to be planted should be subsoiled if possible, or ploughed 10in. or 12in. deep, the furrows being cast-out first and then crowned up so as to level and mix the soil; if this is done there will be less labor involved in planting and the trees will do better. When planting cut off all broken roots, and cut the tops well back, leaving the centre of the tree open. Place the trees opposite each other, about 20ft. apart each way, with plenty of room to turn a couple of horses at the ends of the rows. Every care should be afterwards taken, and the ground well worked to a depth of from 4in. or 6in. Fairly deep cultivation is necessary to conserve sufficient moisture during the hot dry weather. The utilisation of any flood waters would be a great help to the trees, and more effective than summer watering.

From a Commercial View.—Fruit-growing from a commercial point of view is also a source of profit to the State: our apple trade alone has assumed considerable proportions. The prices realised in the British market were considered very satisfactory; in fact, record prices have been reached for South Australian apples. Among the best exporting varieties are the Cleopatra, Rome Beauty, Dunn's Seedling, &c. Other fruit has been successfully shipped to the English market.

Fuller Use of Land.—Country land cultivated for such purposes is being as nearly as possible put to its best use, that is, producing the greatest return in proportion to its area and the labor bestowed upon it. This would mean that more people would be employed on the land, thus lessening the competition in industrial centres. Induce the people to settle on the land, under fair conditions, and competition in other callings will be minimized, their wages will rise, purchasing power will increase, together with the demand for the products of the soil reacting in favor of the producer and consequently the whole community.

Applying to Farm Life.—Perhaps the reason why fruit-growing is not popular with farmers is because they do not devote sufficient attention to the trees. If farmers were to grow their own fruit they would add to the comfort of their homes and the appearance of their homesteads. Farm work as commonly carried on is a monotonous round with little variation; but, with the smaller industries of the farm such as gardening, pig-keeping, poultry-raising, the breeding of sheep and other stock, in addition to a crop of wheat or hay, interesting and profitable employment can be found for all members of the family, even where they are numerous. An industry though not in itself remunerative may, when carried on in conjunction with other things, prove a source of profit. This would make country life much more attractive, and would prevent young people leaving the country for the towns, or perhaps clearing out altogether.

Fruit Diet.—A wholesome fruit diet would go far towards preventing sickness of different kinds, so that we should have fewer doctors' bills, nor would so much animal food be necessary, which has lately become so expensive to buy. The extra wealth drawn from

the soil by the fruit crop would leave no less wool on the sheeps' backs. If one acre in every hundred were used for growing fruit it would not materially lessen the area for grazing or wheat-growing. Great strides have been made in the packing of fruit, and with the removal of inter-State barriers a greatly extended market will be open to us. On the whole the outlook is promising, and I trust that an improved system of mixed-farming and a flourishing fruit industry will, in the near future, be established under the just conditions possible with good government.

OFFICERS.—Retiring officers were thanked, and the following were elected :—Chairman, Mr. G. A. Gallasch ; Vice-chairman, Mr. J. Milne ; Hon. Secretary, Mr. C. Goode.

Bute, July 30.

Present—Messrs. W. A. Hamdorf (chair), A. Schroeter, H. Schroeter, E. Ebsary, D. McEvoy, W. H. Sharman, R. Commons, S. Trengove, A. Sharman (Hon. Sec.), and two visitors.

WATERING HORSES.—Mr. E. Ebsary said when a horse has eaten too much wheat some salt should be put into water and as much given to the animal as it will drink. The salt prevents the wheat swelling. Salt should be put into the water in which wheat is to be boiled as food for horses.

PHOSPHATES.—Mr. Ebsary said he had noticed that some of the superphosphates now being sold were very coarse and gritty, and would like to know if such would be as soluble and produce as good a return as the very fine supers.

IMPACTION.—Mr. McEvoy said he had used a remedy for impaction, made by Mr. Hartley, of Bute, with success.

RAINFALL.—For July, 1·88in.

Amyton, August 1.

Present—Messrs. S. Thomas (chair), H. Gray, Wm. Mills, R. Brown, John Kelly, W. Hughes, Wm. Gum, H. B. Turner (Hon. Sec.), and three visitors.

"ECONOMY."—Mr. Wm. Hawke forwarded a paper entitled "Economy amongst Farmers," which advocated buying and selling on co operative principles, and was well discussed.

Millicent, August 1.

Present—Messrs. H. F. Holzgreffe (chair), W. J. Whennen, H. A. Stewart, B. Varcoe, H. Warland, R. Campbell, H. Oberlander, H. Hart, A. McRostie, J. Davidson, and E. J. Harris (Hon. Sec.).

RAINFALL FOR JULY.—Millicent, 3·41in. ; Mount McIntyre, 3·56in.

FARMERS AND "TRUSTS."—Mr. R. Campbell read some notes on this subject. Mr. Holzgreffe thought that companies or corporations failed to manage business successfully, and it appeared to him that private firms or trusts must be endured, even though they had disadvantages. Mr. Hart said a representative of a Melbourne firm told him that fertilisers are as cheap in Millicent as in Melbourne, and the agent attributed this to the fact that the South Australian Government compelled the Adelaide merchants to reduce the price by a threat to import a shipload and sell direct to the farmers. [The agent must have had a fertile facility for fiction, since the South Australian Government never did threaten to import fertilisers for farmers. A healthy competition exists amongst our importing merchants, and there has never been any necessity to threaten them—even if the Government were inclined to be so weak as to do so.—GEN. SEC.]

FENCE WIRE.—Members mentioned wire fences twenty to thirty years old which are still in good condition, and will bear straining ; but wire nowadays,

in many cases, will not last good for more than a few years. Mr. Holzgreff said a good test as to whether wire is iron or steel is to put the end in the fire till well heated and it can be drawn to a point; but if of steel it will crumble when hammered. The soft steel wire is less enduring than the hard. In a saline atmosphere the steel wire rapidly becomes rusty, but will stand well inland. Mr. Whennen said large holes through the posts were bad in rough country on account of fires; and Mr. Hart said small holes tended to promote rust. Staples had been used with much success in some places.

SUPER.—Mr. R. Campbell said that some farmers in Warracknabeal were using 10lbs. to 20lbs. super. per acre with remarkable results. [Is this ordinary super. or concentrated super., which costs three times as much?—**GEN. SEC.**]

Caltowie, August 13.

Present—Messrs. J. Leahy (chair), A. McCallum, J. G. Lehmann, J. H. Both, L. Graham, J. Noonan, J. Potter, A. Kerr, A. McDonald, N. Hewitt, F. Lehmann (Hon. Sec.), and seven visitors.

HOLSTEINS—Mr. Hewitt thought the climate might be too warm in summer in this district for the Holstein breed of cattle. [The Holsteins for 2,000 years have been bred in a cool climate, where for a good part of the year they have feed in great abundance: therefore they are unlikely to thrive in a locality where there is scarcely any feed, and where the open-air temperature ranges from 30° F. to 150° F.—**GEN. SEC.**]

LAMPAS.—Mr. Hewitt has a horse ill with lampas and cannot get it cured. Some members recommended burning the swellings, and others advocated cutting or lancing them. [Lampas is a severe inflammation of the ridges or "bars" in the roof of the mouth, which often occurs in young horses when shedding their teeth or putting up their tusks. It may occur from over-feeding with corn after having been running for some time on grass. The mucous membrane swells and projects below the nippers, and is so tender that all hard dry food is refused. The treatment is to scarify the part with a sharp lancet, and feed none but soft food for a few days. If this does not cure the trouble, gently rub a stick of lunar caustic over the part every day until a cure results. Wear a glove to prevent the caustic burning the hand, and be careful to avoid rubbing too hard or for too long a time—**GEN. SEC.**]

ROLLING AND HARROWING.—Mr. Kerr had tried harrowing after the drill on part of his crop, and rolling after drilling on another part, and the rolling showed lesser beneficial result. Mr. McCallum thought the result depends on the condition of the soil at seeding. If it is loose and dry the coulters go too deep if the soil is not previously rolled, and much of the seed would malt. He had harrowed the crop on red land with much advantage. Mr. Lehmann said it is necessary to harrow or roll before drilling to level the soil and get the seed covered to a uniform depth, else the hoes and wheels run in the tracks left by the scarifier. For hay, he would use light harrows after sowing the seed.

Colton, August 3.

Present—Messrs. P. P. Kenny (chair), E. Whitehead, John Shepard, W. E. Packer, M. S. W. Kenny, and R. Hull (Hon. Sec.).

MICE AS JUDGES OF WHEAT.—The Chairman said he had about fifty bags each of Steinwedel and King's Early wheats stacked in a barn, and when removing it he found the bags of Steinwedel riddled by mice, whilst not one of the bags of King's Early was touched. He thought the mice were good judges of the milling qualities of wheats.

FIELD TRIAL.—Arrangements are being made to hold a field trial of harvesters at Colton under the auspices of the Great Western Agricultural Society.

TESTING WHEATS.—Mr. Packer wished to know what quantity of wheat would be required to test its milling quality. [Sixteen pounds.—*GEN. SEC.*] Would it be tested by the Central Bureau free of charge? [The Central Bureau has nothing to do with testing or analysing wheat or anything else.—*GEN. SEC.*]

RABBITS.—Mr. Packer wished to learn whether oil of aniseed or tincture of aniseed added to phosphorised pollard for poisoning rabbits would entice dogs to eat it. [Aniseed oil added to baits would be very attractive to dogs, and it is highly probable they would take the bait if they were hungry.—*GEN. SEC.*]

SALT AS MANURE.—Mr. Packer read an extract from a newspaper which was very laudatory of the virtues of salt, not only as a stimulant to plant growth, but also as a tonic for animals, a preservative in some cases, and a decomposing agent in others. Salt spread on grass lands will kill worms, sweeten the grass, make it more luxuriant (if not given in too heavy a dose), and will kill weeds. Where salt has been applied all herbivorous animals will assemble to graze. In small quantities it promotes decomposition of animal and vegetable substances; destroys vermin and kills weeds; is a direct constituent of some plants; acts on vegetable substances as a stimulant; preserves vegetables from injury by sudden transitions in the temperature of the atmosphere. Salted soil does not readily freeze, and salt preserves crops of turnips from injury by frost. Salt renders earth more capable of absorbing the moisture of the atmosphere. Salt rarely causes wheat plants to grow larger or taller, but it fills the ear better and brings the weaker plants forward. Salt should be applied before sowing the seed, using not less than 10bush. nor more than 20bush. per acre. A mixture of two parts of lime and one part of common salt covered with sods and left in a shady place for two or three months will be converted into muriate of lime and soda. Muriate of lime is one of the strongest moisture-absorbing substances, and wherever it exists in the soil the heat of the sun has much less influence than usual. It is important not to use this mixture until it has been incorporated two or three months, and then it can be applied at the rate of 35bush. to 60bush. per acre.

Renmark, August 1.

Present—Messrs. E. Taylor (chair), R. Kelly, F. Wyllie, F. Cole, H. Olorenshaw, F. Turner, J. A. Forde (*Hon. Sec.*), and one visitor.

LIME AND ITS APPLICATION TO THE SOIL.—Mr. W. H. Harrison, M.A., a visitor, read the following paper:—

Lime is very extensively used as a fertiliser, but its action is not generally well understood, and serious mistakes often occur from its indiscriminate use. Most soils contain all the elements of plant food in varying quantities, but however abundant the presence of most of these essential constituents, if any one of them be absent, the soil is perfectly barren, and if present in insufficient quantity the resulting crops are unsatisfactory to the extent of that deficiency. Lime cannot be classed among these deficient substances, for although it enters into the composition of almost all forms of vegetable life, its various compounds are so widely and generally distributed that it would be a very rare circumstance for any sample of ordinary soil to be found on analysis not to contain sufficient lime the requirement of any cultivated plant. Then it may be asked, how is lime a fertiliser? Anything is a true fertiliser which causes a plant to make more vigorous growth and yield a better crop; and lime does this in a two-fold manner, viz., chemically and mechanically. First as to its chemical action. All plant food to be available must be in a soluble condition. Otherwise it is like human food under lock and key. All soils contain animal and vegetable matter in varying proportions and in various stages of decomposition. Now lime, in its caustic condition, is one of the most powerful agents of decomposition, and where from defective drainage or other causes the land is "sour" and where organic matter does not readily decompose, the application of caustic

lime often works wonders, causing these previously inert substances to yield an abundant supply of available plant food. Probably this use of lime on land damaged by seepage would act beneficially. Again lime and its compounds sometimes re-act with injurious mineral substances producing useful or harmless compounds, *e.g.*, the action of gypsum on carbonate of soda. The mechanical action of lime on heavy clay lands is an important aid to fertility, causing the soil to become friable and thereby giving free access to air and water. This mechanical action is shared by several of its compounds, such as gypsum, powdered chalk, pulverised shells, etc. The common mistakes in the application of lime as a fertiliser are the following:—When its *chemical* action is required on sour, boggy land it should be spread and ploughed in as soon as possible after being slacked. It is often allowed to lie in heaps for weeks and months, when it absorbs carbonic acid from the atmosphere and becomes gradually converted into carbonate of lime or chalk. When spread and allowed to remain for some time before being ploughed in the mischief is still greater. Considerable damage sometimes occurs from over-liming. Since caustic lime greatly promotes decomposition, there is a danger of bringing too large a proportion of plant food into available form, resulting in a heavy crop in the ensuing season and comparative barrenness for several years after. It is a common practice to add lime to night soil and other animal manures. Caustic lime sets free the ammonia, thus depriving the manure of one of its most valuable constituents.

Port Germein, July 28.

Present—Messrs. G. Stone (chair), J. K. Deer, W. Holman, H. Kingcome, W. Head, E. McHugh, D. Thomson, P. Hillam, A. H. Thomas (Hon. Sec.), and three visitors.

ANNUAL REPORT.—The Hon. Secretary's annual report showed that the average attendance during the past year had been very poor, only five. He regretted members had not taken a more direct interest in the work of the Branch. Two papers had been read during the year, and he hoped to see a marked improvement in the future. The retiring officers were thanked and re-elected.

Meadows, August 5.

Present - Messrs. W. Pearson (chair), G. Ellis, G. Rice, F. W. Dohnt, J. Catt, F. W. Vickery, R. Brown, W. J. Stone, T. B. Brooks, G. T. Griggs, D. D. Murphy (Hon. Sec.), and three visitors.

CONFERENCE.—Some members promised to attend Conference of Branches at Mylor, on September 26.

EXPORT OF APPLES.—Mr. Griggs in February last sent twenty cases of apples, principally Ribston Pippins, to Java, and netted 5s. 3d. per case. He sent fifty cases, mostly Cleopatra, to London, which realised only 2s. 10½d per case. Later on he sent twenty cases to Java which netted 6s per case, and two cases of Vicar of Winkfield (wrongly called Napoleon) pears which netted 8s. per case.

BEST APPLES FOR DISTRICT.—The following were named as the best apples for this locality:—Rome Beauty, Dunn's Seedling, Esopus Spitzenberg, Strawberry Pippin, and Scarlet Nonpareil.

Tatiara, July 27.

Present—Messrs. W. E. Fisher (chair), E. Prescott, A. D. Handyside, M.P., H. Killmier, F. Smith, C. H. W. Wiese, T. Moten, and T. Stanton (Hon. Sec.).

SUBJECTS.—Mr. Killmier suggested that, when there is a dearth of subjects for discussion, some of the papers published in the *Journal of Agriculture* should be taken up. This was agreed to by all other members.

FERTILISERS.—Mr. W. E. Fisher read a paper to the following effect :—

He was glad to note that all farmers were now steering in the right direction with regard to the use of fertilisers. By the use of the drill and manures of the right sort, lands which were formerly unprofitable were rendered fertile and valuable. The pasturage was also improved by the use of fertilisers. But these manures differ greatly in quality and value, and one cannot tell which is good or which is poor by color, smell, or appearance. The farmer who goes by the price may make a great mistake, and for the sake of saving a few shillings on the cost of the manure may lose a great deal on the value of the crop raised from it. There are many brands of superphosphate and bone super. He preferred to use bone super. In superphosphate there was a certain portion which was readily soluble in water, another portion which would dissolve in citrate of ammonia, and a third portion which would neither dissolve in water nor in citric acid. [Bone super. does not differ from mineral super. in this respect. —*GEN. SEC.*] Some of the supers. contain a larger portion of water-soluble phosphoric acid than other sorts, and, of course, give quicker results, whilst those which contained a great proportion of citrate-soluble phosphate were slower in action. But nitrogen and potash are also necessary to the well-doing of plants; and, if either of these are also deficient in the soil, the deficiency must be supplied.

Watervale, July 27.

Present—Messrs. C. A. Sobels (chair), J. Thomas, T. Solly, B. Perrin, G. Holder, E. W. Castine, C. H. Castine, H. A. Ashton, J. Scovell, and E. Treloar (Hon. Sec.).

FRUIT-GROWING.—Mr. Perrin tabled fine specimen of Rome Beauty apple. Members consider this a good variety, but it is inclined to be a shy bearer. The question of whitewashing trees was discussed. Some members thought it did little good, while others held a contrary opinion. Mr. Treloar stated that he had peach trees ten years old worked on almond stocks; up to the present they had borne very little fruit, though they had grown well. They were very subject to disease and gumming, and throw up numerous suckers. He considered it a great mistake to work peaches on almond stocks.

MANURING.—Commercial fertilisers are being used to a large extent in this district, and one leading farmer has manured fifty acres with mineral super. at the rate of 2cwts. per acre, an experiment that is being watched with great interest.

Davenport, August 8.

Present—Messrs. W. J. Trembath (chair), J. E. Leckey, J. Holdsworth, T. McDowell, A. McDonald, T. Totman, W. Hodshon, J. Roberts (Hon. Sec.), and three visitors.

POULTRY.—The Chairman reported that the efforts to form a Poultry Breeders Association had been successful, and the first show would be held on September 5. Mr. Holdsworth gave some interesting information concerning the exhibits at the recent show of poultry in Adelaide.

Murray Bridge, August 7.

Present—Messrs. R. Edwards (chair), W. Wundersitz, J. G. Jaensch, J. Stacker, G. A. Kutzer, W. Schubert, W. G. Hannaford, Heinrich Schubert, Hermann Schubert, and W. Lehmann (Hon. Sec.).

BACON-CURING.—The Hon. Secretary initiated a discussion on feeding and fattening pigs for bacon-curing. He found it a common practice with farmers to allow the pigs to become too old before commencing to fatten them for market. The result was that very often the pigs grew too large and rakey or too fat and heavy. It was against nature to consume in this hot climate very fat bacon, and it was not good management to allow pigs for bacon to become too large and fat. His experience was that the demand was always towards small sides of bacon—choice handy-size commanding the highest market price.

Farmers should therefore try to fatten their pigs to produce the highest market quality of bacon. Feed the young pigs as soon as they will take to feeding, and continue to feed them well so as to have them weigh 100lbs. to 120lbs. when six or seven months old. It is waste of labor and feed to keep them after they reach that weight, as heavier weights fetch less per pound. Young pigs thrive best when they receive a little fresh skim milk daily until they are about half grown, after which the milk is not necessary.

Mount Gambier, August 15.

Present—Messrs. W. Mitchell (chair), T. L. Browne, A. J. Wedd, J. Dyke. W. Barrows, J. Kennedy, M. C. Wilson, G. Body, T. H. Williams, D. Norman, jun., J. Watson, J. C. Ruwoldt, and E. Lewis (Hon. Sec.).

PHOSPHATES.—The Registrar of the School of Mines promised by letter to supply samples of mineral phosphates when possible.

BEALE'S "GAMBIER" APPLE.—This handsome apple was raised from seed by Mr. C. Beale at the Forest Nursery, Leg of Mutton Lake. The waters of the lake rose and drowned the tree, but scions have been taken by various persons, and Mr. Wedd produced a specimen of the apple, which had been very highly approved by some Victorian pomologists.

BULL.—The bull loaned by the Agricultural Department to this Branch has proved to be of no use, and it is desired that it should be got rid of.

RUGGING AND SHELTERING COWS.—Mr. Williams directed attention to Mr. G. S. Thomson's article in latest issue of *Journal of Agriculture* on rugging and sheltering of dairy cows during winter, and strongly recommended all owners of live stock to carefully study it. Messrs. Wedd and Browne agreed with Mr. Williams, and had noticed in Victoria that some owners found advantage from rugging. Mr. Wilson said hedges make good shelter in winter, and pines give much-needed shade in summer.

TUBERCULOSIS.—A warning having been printed *re* danger from exhibition of bacilli of tuberculosis, Mr. Williams assured members that all such germs are effectually destroyed before exhibition. In reference to a statement that there is no danger in eating the flesh or drinking the milk of tuberculous cattle, Mr. Williams said Professor Koch did not say there was no danger. He said the risk was not so great as some people were inclined to think. He (Mr. Williams) thought, however, that the other professors who disagreed with this view were quite as capable of expressing an opinion as Dr. Koch. The Chairman said he noticed that experiments had been made by fattening calves on milk from tuberculous cows, and that so far there had been no appearance of the disease in the calves. Mr. Williams said it usually took from three to three and a half years for the disease to show itself. The Chairman said experts seemed to think the danger was greatest where the udder was infected. Mr. Williams said that when a beast was diseased it was impossible to say when the udder was infected. Although it might be impossible to feel the growths in the udder, the disease might be there in a very diffused form. It might be there two or three months before there was a growth in the udder which could be felt. Much mischief might be done before the disease was apparent. He had seen many cases like that. To his mind it was rather a dangerous statement to make—to say there was no danger unless the udder was infected. To keep a tuberculous cow with healthy ones he thought was like standing on the brink of a volcano. The Chairman said he had seen a report in a Glasgow paper where this matter was discussed at a meeting of the most able men in Britain. Mr. Williams said they also had statements on the other side. If the disease were plague they would be told to keep away from it, and yet this was the greatest plague there was.

Cherry Gardens, August 15.

Present—Messrs. C. Lewis (chair), T. Jacobs, G. Hicks, J. Lewis, A. Broadbent, H. F. Broadbent, J. Metcalf, H. Strange, E. Wright, W. B. Burpee, G. Brumby, C. Ricks (Hon. Sec.) and one visitor.

CONFERENCE.—A majority of the members will attend the Conference of Hills Branches to be holden at Mylor on September 26.

CABBAGE AND CAULIFLOWER GROWING.—Mr. Strange read a paper to the following effect :—

CABBAGES.

For a spring crop the best are Early York, Shephard's Early, St. John's Day, and Grigg's Early. For a summer crop—London Market, Large York, Coat's Excelsior, and Wescombe's Nonpareil. For an autumn crop—Drumhead, Grigg's Late, Enfield Market, and Brunswick.

Times for sowing, planting, &c., vary according to localities. For this district, and for a spring crop, sow the seed the first week in March; $\frac{3}{4}$ oz will seed a bed 4ft. x 4ft. Keep it well watered and sprinkle a light dressing of stable manure over the bed.

Prepare the ground on which the plants are to be grown by deep digging in a light dressing of stable manure and 2cwt. of good bonedust to every nine rods of land. The bed should be thoroughly mixed and pulverised to a depth of 10in. or 12in.

Plant out the first week in May, if there is sufficient rainfall, 2ft. x 2ft. apart. Plant on hillsides, as the gullies will be too cold for this early crop, and choose the best sheltered position. When the plants have been in about three weeks and begin to show new leaves give them a good hacking or hoeing, and after that hoe two or three times to destroy weeds. When there is plenty of rain, and the plants are three-parts grown, give a very little sulphate of ammonia near the roots of each plant—a teaspoonful will be enough.

For a Summer Crop.—Sow seed first week in September, and plant out when ready.

For an Autumn Crop.—Sow middle of January, and plant out when ready.

For summer and autumn crops plant in situations where the beds can be irrigated, and cultivate in the same way as for a spring crop.

Seed.—Always save the earliest matured plants of any crops for producing seed, and of these give preference to the best shaped and largest, with a small stump, and free from little buds. Keep the different sorts well apart, else the seeds may become inoculated.

CAULIFLOWERS.

The proper season for cauliflowers is the winter and spring. The best sorts for autumn or winter crops are Early London, Early Dutch, Snowball, Asiatic, and Veitch's Autumn Giant. For spring crops Walcheren and Bartlett's Excelsior.

For Autumn or Winter Crop.—Sow the seed in the middle of January, cover the seed bed with a light dressing of stable manure, water regularly, and plant on land that can be irrigated.

For a Spring Crop.—Sow the seed first week in March under same conditions as for autumn or winter crops, and plant out first week in May on hillsides. Manures and cultivation same as for cabbages. Plant 2ft. 3in. x 2ft. 3in. apart in rows.

Seed.—Save the best cauliflowers for seed bearing, never cut the head or flower, and keep well watered when forming seed.

Members all agreed that it is necessary to save all the manure possible from horses, cows, pigs, &c., and to use the so-called artificial manures also for both gardens and orchards.

Onetree Hill, August 2.

Present—Messrs. J. Bowman (chair), H. H. Blackham, F. Bowman, J. Flower, F. L. Ifould, W. Kelly, and J. Clucas (Hon. Sec.).

LABOR IN RELATION TO AGRICULTURE.—Mr. Ifould read a lengthy paper to the following effect :—

Having to compete in the world's markets with their produce, the labor question is an important subject with farmers who are subject to a most uncertain rainfall. There is no proper proportion between the cost of labor and the value of produce. Even where there is a fairly certain rainfall and moderately good crops the farmer has to carefully manage in order to receive a credit balance. Then, what chance of profits have those farmers who occupy land where a crop is secured only once in three to seven years? They are simply wasting their own and their families lives and labor; and this must inevitably be the case wherever land is resumed or set apart for agriculture in localities where the average annual rainfall does not warrant that course. There are many thousands of acres occupied for wheat-growing which

are fit only for pastoral pursuits. Where wheat sells at 2s. 6d. per bushel and hay at 30s. per ton farming cannot pay on labor at 6s. per day (of eight hours, if certain people could have their way) unless extraordinary good crops could be raised. Men object to work on a farm at £1 per week and board, when they can get 6s. a day of eight hours in the centres of population, where they have every facility for spending their easily earned money. Yet the man on the farm is better off because he can save practically all his earnings, whilst the other saves nothing, and even gets into debt. In busy times it is difficult to get men who understand the work they are required to do. Whenever a farmer gets a good man who knows when he is well off and able to save money by working on a farm, it will be worth his while to study his comfort and treat him generously so as to retain his services. Such men are not readily replaced. When the farmer has a family of sons he may not have the same trouble, with respect to labor, if he treats them with consideration. Where his boys leave home and seek employment elsewhere the farmer has himself to blame. He should endeavor to make home attractive, appreciate their labor, and make them understand that everything done is for mutual benefit. When the boys are led to think that the reward is too far distant, and present pay for their labor is absent, it is no wonder if they are dissatisfied. Still, the farmer must reckon the value of the labor of his family in making up his accounts. Were farmers able to secure good laborers who understand their work and do it well, the result would be better farming, better crops, and better results all round. Slipshod work cannot be profitable. Where a farmer is able to spend a few pounds on labor it will generally pay him well to do so; but, when the labor costs more than the value of its product it is no wonder if the far northern farmer is compelled to dispense with the luxury as far as possible. Under present climatic conditions it is desirable that those farmers in the rainless far northern areas should abandon their holdings to pastoral occupation and come southward, where there is a fair average rainfall, proximity of railways and ports for shipment, lesser cost of carriage, facilities for marketing, and where by the use of fertilisers and machinery he can raise paying crops. Thus, the State would also benefit by the profitable occupation of the pastoral country and the better utilisation of the agricultural lands.

In discussion it was stated that really good farm hands are exceedingly scarce, and can always find employment; but men have been known to demand the highest wages, and yet did not know how to put a collar on a horse. The high wages and short hours adopted in the centres of population attracted young men from the country, and placed farmers at a great disadvantage. The employer should be just, and not over-exacting. Parents should see to it that their children cannot be too easily tempted to leave their home. A system that shields and shelters the loafer, and places all labor on an indiscriminating footing, induces tyranny, fosters inefficiency, and is inimical to the best interest of the community.

Maitland, August 3.

Present—Messrs. J. A. Smith (chair), T. Bowman, C. F. G. Heinrich, W. Wilson, A. Jarrett, W. Bowey, J. Hill, J. Kelly, A. Treasure, W. H. Wundernitz, W. Adams, E. W. Moody, and Dr. G. Nicholls (Hon. Sec.).

NORTHERN HERBS AND GRASSES.—Mr. R. W. Wilson, of Hergott, to be thanked for sending a parcel of seeds of various indigenous grasses and herbs which are eaten by stock in that locality, seeds to be tried by the members.

Meningie, August 3.

Present—Messrs. M. Linn (chair), W. J. Botten, S. F. Robinson, Thos. Joy, T. W. R. Hiscock, A. J. Myren, C. J. Shipway, and H. B. Hackett (Hon. Sec.).

SHEEP ON FARMS.—Mr. Joy thinks Merinos are most profitable, and give least trouble in the paddock; Shropshire lambs are good for export, but the wool is less valuable than that of Merinos. Mr. Myren thinks Lincoln and Merino cross is best for farmers; they grow quickly, thrive on poor pasture, and there were cases where that class of wool brought higher prices than that of Merinos.

HORSE DISEASE.—Mr. A. J. Myren said he had an old horse which suffered in his urinary organs. When standing still the animal could not pass his water, but when moving an involuntary discharge took place. The horse became useless, and he killed him. Upon opening him, the bladder was found to be as large as a half-gallon can, and contained a stone or calculus weighing 16lbs. The kidneys also contained a number of "gall stones" of a similar nature.

SAND IN COW.—Hon. Secretary reported the death of a cow, which, on being opened, was found to be full of sand.

Mallala, August 5.

Present—Messrs. G. W. Bischof (chair), H. B. Moody, A. F. Wilson, W. Temby, S. Temby, F. M. Worden, A. Moody, J. McCabe, J. Jenkins, M. H. East, W. R. Stephenson (Hon. Sec.), and two visitors.

RULES.—Some of the members having never read the rules or heard them read, the Hon. Secretary read them aloud. [A very good idea. Another good idea would be to get each member to read his monthly copy of the journal from beginning to end.—GEN. SEC.]

IMPROVEMENT OF LAND.—Mr. M. H. East read a paper on "Exhaustion of Land by Stock compared with Exhaustion by Cropping," as follows:—

Live stock derive their bone, wool, flesh, and milk from the grasses upon which they feed, and the grasses in turn from the land. The common belief is that stock improves the land, and add to its mineral wealth by their droppings. Such a notion is absurd. Extensive experiments have proved that to build up a bullock in four years, say to 1,000lbs. live weight, he will have extracted 40lbs. of mineral substances, leaving out the nitrates; or a cow giving 400galls. of milk annually will consume 150lbs. of minerals in the same time; whilst a sheep, to build up its wool only, absorbs nearly all the potash it extracts from the plants of its natural food; besides the other properties it requires to form bone, blood, muscle, &c. By a simple process of pressure and cold water 14 per cent. of potash can be extracted from wool, or in other words 1,000lbs. of wool will give off 90lbs. of carbonate of potash, so that sheep are more exhaustive on this mineral than any other animal. To such an extent were the Cheshire dairying and grazing pastures impoverished that it was necessary to treat them with bone manure to restore it again to fertility. It is evident by this fact that the droppings did not compensate the land for the minerals drawn from them. It has been proved again and again that land that has carried 1,000 head of cattle when first stocked will not in a few years carry one-third of that number, while some pastoral lands in the South-East, when broken up for cultivation, did not yield as much as the adjoining paddocks that had been used only for cropping purposes. It is my opinion that the land of this district will pay better cultivated then grazed. To combine the two, you have less crop and less fallow, which does not pay. I can quote cases in this locality where two years' fallow have given from 50 per cent. to even 100 per cent. better returns than one year's fallow have done, and if the land were only cultivated after two years' fallow there would always be the same results, because the ground would have two years' moisture reserved. During that time the moisture and air would revive it and throw life and activity into it. [Are plants the only agencies which extract moisture from the soil?—GEN. SEC.] I will try to explain the action that would be going on during that time of moist fallow. The capillary action is disseminating the soluble minerals through the ground, whilst the ammonia that is held in solution in the rainwater is extracted and held by the soil, and will be there for food for the plant, and the humus is thrown into activity by decomposition through moisture, and the carbonic acid attacks the minerals and reduces them to a soluble state making them fit for plant food, and the nitric acid is liberated from the humus so that it is of use to the plant. All are familiar with the old saying "Open up your land so that the air can get to it." Ground that has been broken up has a greater power of drawing vapor of water from the air and condensing it during the capillary action, and this in a degree determines the absorption of vapor gases.

Mr. H. B. Moody would like to know what relative prices should obtain for wheat and sheep in order to gain the most profit. The Hon. Secretary considered that beef and mutton were dear enough already, and if farmers were to give up grazing, meat would be very much dearer. That phase of the subject

was the weakest in Mr. East's paper. Mr. McCabe did not agree with two years' fallow. Many farmers could not have lived without cattle and sheep. One year's fallow cost £1 per acre, and double fallow would cost 10s. more, at least. Should the season be favorable, the better the cultivation the better would be the return. Members did not think the extra return would compensate for the loss in feed for cattle and sheep.

Mount Compass, August 10.

Present—Messrs. F. Slater (chair), F. McKinley, S. H. Herring, M. Jacobs, W. Gowling, C. S. Hancock, and A. J. Hancock (Hon. Sec.).

SEASONABLE WORK.—Sow beets, carrots, onions, mangolds, field peas. Prepare ground for potatoes.

EXPORT OF APPLES.—Mr. Jacobs sent thirty-seven cases of apples to South Africa which returned 8s. 6d. per case net.

BIRDS AND WEEDS.—Mr. Slater started a discussion on this subject. [Thy Hon. Secretary reports no further as to what he said, but it was most probable to the effect that birds pick up vast quantities of seeds of weeds, and myriads of caterpillars, grubs, maggots, and mature insects, which would otherwise devastate the orchards and gardens.—GEN. SEC.]. Members think that if weeds are destroyed it will prevent the increase of insect pests.

DOG TAX.—It is felt that the dog tax is oppressive, as it is necessary to maintain dogs in order to keep the rabbits down. It was resolved to ask the district council to reduce the tax or licence fee.

PRUNING DEMONSTRATION.—On July 17 Mr. Geo. Quinn, Horticultural Instructor, gave a demonstration of the art of pruning fruit trees in Mr. Hancock's orchard. There were a good many persons present, and valuable instruction was given.

Boothby, July 29.

Present—Messrs. J. T. Whyte (chair), R. M. B. Whyte, R. Carn, J. Bell, R. Chaplin, M. Leonard, T. Sims, J. A. Foulds, E. Bradley, J. R. Way, G. T. Way (Hon. Sec.), and three visitors.

IMPROVEMENT OF DAIRY STOCK.—Mr. R. M. B. Whyte read the following paper:—

As every farmer in this district keeps a few milking cows, it will pay them to breed the best for that purpose. Dairy cows will command a high price for some time to come, because so many have been fattened and sold for beef on account of the high prices ruling. Large breeders will not study breeds for some time, as they want cattle for beef, and they will breed anything until they get the supply up again. The best breed of good milkers is a cross between the purebred Jersey bull and a Shorthorn cow, or any large-framed cow will mate well with the Jersey. The cross is large enough, and not so delicate as the purebreds, but it is necessary that the bull should be purebred. There are a number of the first cross calves saved for bulls because they are larger, and perhaps better looking, than the bull himself, but their stock will not be so good. Many farmers object to Jerseys because they are a bit wild; but they are all right when broken in, and make nice quiet cows. When a farmer has a few really good cows together they are soon well known, and if he wants to sell one at any time, he has not far to look for a buyer; but if they are a mixed up lot his only chance is to fatten and send them to market, and as a good cow costs no more to keep than a bad one, weed out the duffers, breed only from the best, and there will soon be an improvement in the dairy stock.

Mr. Ifould had found that crossbred Jersey bulls are very treacherous to other cattle, especially bullocks.

SOWING SUPER., &c.—Mr. Foulds sifted out all the lumps for sowing manure broadcast, but it was not a success. Mr. Sims said the seed sower would break all lumps.

Ororoo, August 16.

Present—Messrs. W. S. Lillecrapp (chair), J. Moody, E. Copley, M. Oppermann, G. Harding, R. Coulter, jun., W. Robertson, and T. H. P. Tapscott (Hon. Sec.).

CULTIVATION OF SALTBUSH.—Mr. Coulter read a paper suggesting experimental cultivation of saltbush, to the following effect:—

The limited and scanty rainfall in the locality (Upper North) compels the conclusion that the settlers cannot depend upon wheat-growing for a living, and the experience of the past six years proves that no reliance can be placed on indigenous grasses, or any annual growth. If the summer rains fail, so do the grasses. It naturally follows that any indigenous or other perennial fodder plants that will withstand the droughts to a greater extent than the annual grasses are worthy of careful attention. Foremost in the list of these hardy plants are the various saltbushes, which have lessened the enormous losses that would have been sustained during the past six years had they not existed and been the means of saving a remnant of the flocks and herds from the actual starvation to which the rest of the live stock have succumbed. Perhaps saltbush is not quite as nutritious as the grasses, but it has proved to be a good standby, and cattle and sheep thrive and fatten on it. Cows also produce good butter when maintained on saltbush; whilst human beings are said to have existed for a time upon the boiled leaves. The saltbushes are deep-rooted evergreen plants in most of their species, and appear to thrive where there is scarcely any rainfall, producing new growth with the smallest downpour. If our indigenous saltbushes were foreign plants instead, it is possible more attention would have been devoted to their introduction and cultivation. As it is, they have been systematically destroyed. No care has been taken to prevent stock feeding the saltbushes out of existence, and the wonder is that any plants are left alive. It would appear that saltbush is long lived, and this may account for the number of old dilapidated plants and the scarcity of young specimens. [The essayist then referred to three species of saltbush of which he did not know the names; one very large, seldom eaten by stock; another annual species, dependent upon the rainfall, and the third, which from his description may be an *Atriplex*—Gen. Sec.] The third is not coarse, grows almost everywhere, but thrives best on a loose limestone or loamy soil. Californian and Cape Colony farmers have introduced and cultivated Australian saltbush to a very considerable extent, and it ought to do even better in its own country of Australia. Some experimental stations ought to be established in certain parts of South Australia, where experiments in cultivation of indigenous and introduced plants of economic value can be properly conducted.

Port Broughton, July 29.

Present—Messrs. W. R. Whittaker (chair), W. Dalby, S. M. Bawden, J. Bates, B. Excell, A. H. Dolling, G. Pattingale, E. Dalby, J. Harford, W. Tonkin, and J. Barclay (Hon. Sec.).

BINDER v. STRIPPER.—Mr. W. Dalby read a paper dealing with the difference in the cost per acre of stripping a wheat crop as compared with reaping the same with the binder and thrashing with the disc header. It was presumed that the implements in all cases have already been purchased, and that their original cost is not taken now into consideration. A binder would gather in as large an area in a day as would be got over by a stripper, provided each machine has the same width of cut. Thus far the cost per acre is practically the same. The binder requires about 3lbs. twine per acre, at 8d. per pound—there were twenty-five acres reaped by him last season. One man stooking for three days cost 15s.; carting, thrashing, stacking the straw, three men for twelve days at 5s. each per day, and 10s. for the wagon, making a total cost for the twenty-five acres of £12 15s., or 10s. 2d. per acre. The land yielded 16bush. of grain and about 1½ tons of straw per acre. In the above account nothing was allowed for breakages, shifting horseworks, &c. The cost of stripping would be about the same as reaping and binding it, except that he used one horse extra at 2s. 6d. per day, making the final cost of the grain a trifle under 10s. per acre by the stripper, against 10s. 2d. by the binder, with the stacked straw to the good. Members decided that each will bind a portion of his crop and save the straw.

FOREST TREES.—Mr. Dolling read extract from the *Home Journal* showing the necessity for the conservation of forests and the planting of forest trees. After discussion it was resolved to recommend that the Forest Department should establish a block of at least 100 acres of forest trees in each hundred, to serve as an object lesson.

Clare, August 9.

Present—Messrs. W. Kelly (chair), H. Carter, T. Bray, S. Smith, C. J. McCarty, and H. J. Yelland (Hon. Sec.).

PRODUCE EXPORT DEPOT.—The Hon. Secretary stated that the manager had pointed out that the private speculators—at least the leading dealers and shippers in Adelaide on private speculation—were agents for the boats by which the depôt had to forward their fruit. They are able to allot space for themselves as they wish, and offer the balance to the depôt. The depôt has to reserve space nine months ahead, and therefore it is necessary for the manager to have the promise of fruit to ensure the space he engages for the year being filled up. The depôt can forward fruit, and, after expenses, has returned 6s. per case, whereas the seller or producer here sold many kerosene cases for 3s. per case, and a kerosene case holds eight or ten more apples than an export case. The depôt supplies wrapping paper and wood-wool, advances the cost of freight and cooling in Adelaide, and on receipt of cable message forwards the amount of net receipt. Members were unanimously of opinion that the depôt should be supported by the growers of fruit in this district.

Yorke town, August 10.

Present—Messrs. C. H. Davey (chair), C. Domaschensz, J. Latty, B. Lloyd, A. E. Anderson, S. Vanstone, T. Corlett, A. Jung, J. Koth, and J. Davey (Hon. Sec.).

DISCUSSION.—Various matters of local interest were dealt with. Members stated that the grubs were doing considerable damage in many of the wheat paddocks. The wheat crops and grass generally are rather backward.

Arden Vale, July 29.

Present—Messrs. E. H. Warren (chair), C. Pearce, A. W. Fricker, C. Miller, F. A. Francis, C. Hanneman, A. Hanneman (Hon. Sec.), and seven visitors.

ANNUAL REPORT.—Hon. Secretary read annual report. Seven meetings were held with average attendance of eight members. Four practical papers were read and well discussed. Two specially interesting subjects were fully discussed. A visit was paid by members to drilled and manured crops in Arden Vale in November last, and members were entertained by Mr. and Mrs. Warren, at Arden Vale.

RAIN-MAKING EXPERIMENTS.—The Hon. Secretary read a paper suggesting that, in view of the long droughts in the North, some experiments ought to be undertaken under scientific direction with a view to compel the moisture-laden clouds (which often hang over the thirsty land for days) to condense into heavy rains. The Branches of the Bureau should collect information upon the subject, and make suggestions as to how experiments to produce rain should be conducted. Clouds with probably millions of tons of water in them often

hang over the land for days. There may be a few light showers from them, and then they pass away with the wind. There were various theories as to the natural forces which cause rain to fall. One is that if clouds containing moisture come into contact with cold air the vapor in them is condensed into drops of water which fall to the earth; another is, that if the clouds have to pass over high mountains the vapor in them is compressed and formed into rain; and another is that if there is too much heat and electricity in the air and plenty of rain clouds the electricity explodes through friction with the clouds, and the concussion caused thereby compresses the moisture, which comes down as rain. This is what is called a thunderstorm. Human agency cannot create the cold air, nor set up mountain ranges; but it may be possible to create concussions amongst the rain clouds by firing dynamite or other powerful explosives amongst the rain clouds by the aid of electricity. Perhaps the bombs could be elevated by the agency of balloons, or they could be utilised in investigating the phenomena connected with deposition of rain from the clouds. If the matter were taken in hand by the State, inquiries, investigations, and experiments might be entered upon, and no end of good would result if it were made possible to produce a fall of in. or more of rain each time in place of a few points which are deposited under present conditions. Mr. Warren said that Lord Kelvin had expressed the opinion that rainfall could not be assisted in the manner indicated; but Professor Dewar believed that good results would result from spraying the clouds with liquid air. The area of cloud that could thus be affected would have to be determined by experiment. Experiments also should be conducted to show whether rain can be drawn from clouds by concussion or vibration. The immense rainfall in the Himalaya Mountains is ascribed partly to the concussion caused by resistance of the great range to the cloud area, and partly to the forcing of the warm moist clouds into the upper regions of cold air, which resulted in condensation. Several other members spoke in favor of experiments for the production of rainfall.

Kapunda, August 17.

Present—Messrs. W. Flavel (chair), G. Teagle, R. Shannon, W. M. Shannon, Pat. Kerin, Peter Kerin, C. E. Weckert, J. H. Pascoe, J. O. Dea, R. B. Banyer, and G. Harris (Hon. Sec.).

POULTRY.—The Hon. Secretary read a paper on “Will Fowls Pay?” to the following effect:—

It all depends on the way they are managed and the sort of fowls kept. They want to be fed regularly three times a day, and through the cold weather they want warm food once a day. I give my fowls crushed barley scalded and mixed up stiff, which is fed to them hot in the morning. They get wheat at dinner time and the same in the evening. I have been keeping fowls for over twenty-five years, and have tried different ways of feeding, finding this is the most profitable way in cold weather. In the summer I give them wheat in the morning, Jersey tree kale at midday, and wheat in the evening. The crushed barley is too heating for summer feeding. If you plant Jersey tree kale it will give you green food for two seasons, as it only requires planting every two years; fowls do well on it and it keeps them healthy. I have tried a good many sorts of fowls and find White Leghorns the best. They are hardy fowls and good layers. Young birds will lay at four to five months old. They require to be kept clean. Do not allow the droppings to accumulate under the roosts, as the fowls inhale the gases from them and become sickly. The fowl houses should be cleaned out twice a week. Use gas lime or fresh lime for the floor, and mix some tar and kerosine together and do over the roosts once a week. This will keep the tick and lice away. If you have any tick or lice in your fowls get a bucket full of ammonia water, which may be obtained from the gasworks, and dip them in up to their necks. It will discolor the feathers, but will destroy the tick and lice without injury to the fowls. All roosts should be suspended with wire from the roof so that no tick can get on to them. Fowls require fresh water every day, and in summer put a little lime in their water about twice a

week. The Leghorns will not sit. If you want to breed you require some common fowls for sitting, and change your rooster every year. I had sixty White Leghorns and twenty common fowls last year, and obtained from them 490 doz. eggs during the year, which realised £25 3s. 6d. The cost of wheat and crushed barley for food was £9 12s., leaving a net profit of £15 11s. 6d. When eggs are cheap I preserve them and sell when they are scarce. It costs very little to preserve them: Take 2lbs. of fresh lime, pour 4galls. of boiling water over the lime, and then add 1lb. of ordinary salt. This will preserve 25 doz. eggs. They will keep for eight or nine months, and the eggs come out equal to fresh-layed eggs. They require to be put in fresh from the nest every day, and must not be exposed to the sun. I would advise anyone keeping fowls to try the White Leghorns. They do not eat any more food than the common fowl, and will give much larger returns.

Mr. Teagle suggested the use of Cooper's sheep-dip as a destroyer of tick and lice. It was a sure remedy. Mr. O'Dea thought there were other breeds of fowls besides Leghorns that were profitable. Leghorns were not good table fowls though good layers. Minorcas could be kept with profit. Mr. Pascoe said Leghorns were as good fowls as could be kept for laying. No doubt fowls wanted more attention than they usually got if they were to be made payable. Mr. W. M. Shannon was not altogether in accord with Mr. Harris, who had simply treated the subject from the egg-producing aspect. So far as laying was concerned there was nothing to be said against Leghorns, but they were not good enough for the table. For general purposes a larger fowl was required. If they were to go in for poultry breeding it must be for a class that would do for the table, for which descriptions there would always be a market in large centres of population, especially in the old world. Now they had freezing works there was no reason why poultry should not be bred for export. Mr. Harris had kept the larger breeds, but his experience was that the laying fowls were the most profitable. English Game was a good breed, being good layers and a good table fowl.

Burra, August 9.

Present—Messrs. F. A. S. Field (chair), E. Goodridge, W. G. Hawkes, A. McDonald, F. G. Dawson, Jas. Scott, J. H. Arnold, and R. M. Harvey (Hon. Sec.).

SALT PATCHES.—Mr. J. H. Arnold wished to know how to reclaim or make use of land that had become salty. Mr. Dawson said he understood that mangolds had been grown successfully on such land, but his experiments in this direction had not been successful. Mr. Goodridge stated that the manager of Gum Creek Station was breaking up large patches of salty ground and sowing various grasses. [Mangolds are grown in many parts on salty soils with great success. Where salt is not plentiful in the soil, it is a common practice to top-dress mangels with common salt, at the rate of 2cwts. to 3cwts. per acre.—GEN. SEC.]

Golden Grove, August 1.

Present—Messrs. J. R. Smart (chair), S. A. Milne, J. Woodhead, T. G. McPharlin, R. Smith, W. Mountstephen, J. Ross, A. Harper, F. Buder, A. Robertson, and J. R. Coles (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary reported on proceedings during the past year. Mr. Smart asked that a new chairman be appointed, and Mr. R. Smith was elected to that position, Mr. J. R. Coles being re-elected Hon. Secretary. A vote of thanks was accorded to retiring officers.

CONFERENCE AT GUMERACHA.—Members supported proposal to hold Conference of Branches at Gumeracha, and suggested October as the most suitable month.

Balaklava, August 10.

Present—Messrs. G. Reid (chair), C. L. Reuter, E. Huins, G. Neville, A. Manley, A. W. Robinson, J. Vivian, A. Hillebrand, W. H. Thompson, and E. M. Sage (Hon. Sec.).

ARTICHOKES.—Mr. Neville wished to know if the artichokes growing so well in the district were the same as those grown for culinary purposes. [The bases of the flowers of the common artichoke are used for culinary purposes, and is quite different from the more largely grown Jerusalem artichoke, a tuberous rooted plant belonging to the sunflower family.—GEN. SEC.].

FARM IMPLEMENTS.—Mr. Manley read extracts from paper dealing with the alleged combination of importers to keep up the price of binders and other implements. A long discussion on the merits of the different makes of binders took place.

Mylor, August 3.

Present—Messrs. W. J. Narroway (chair), W. H. Hughes, E. Hayley, E. J. Oinn, T. J. Mundy, J. Roebuck, F. G. Wilson, J. Smith, F. R. Newberry, P. P. Probert, C. Nielson, W. G. Clough (Hon. Sec.), and eight visitors.

PROPAGATION OF FRUIT TREES.—Mr. W. Nicholls read the following paper on this subject:—

The method adopted in the propagation of fruit trees should form a part in the education of every one interested in fruit growing, and perhaps it is more important in this district than in many others where they have old and established orchards. Here a fairly large number of people are engaged to a greater or lesser extent in growing fruit trees. The knowledge of methods adopted in propagating them would not only prove a source of profit by enabling them to raise a portion of their nursery stock, but would also enable them to see how, in many instances, they were taken in by the vendors of the cheap and nasty kind of nursery stock. For instance, hundreds of apple trees have been planted in this district which are now found to be reeking with woolly aphis; these trees are only single worked, and in many instances are actually worked on roots taken from trees already infested with blight. Then, again, we find the peach worked on almond stocks, which destroys any chance the peach may have of being a success in this district; or plum worked on seedling stocks that will send up a crop of suckers as thick as a 40bush. crop of wheat. The trees have in all probability cost within a penny or two of the price of properly-worked trees supplied by reliable nurserymen, and their cost to the grower will, in after years, represent a very large rate of interest on the money saved by their purchase. A knowledge of propagation is also necessary if we are to be in a position to take full advantage of the privilege which the Government Typical Orchard, which has been established here, offers us. There we will be able to obtain scions of the numerous varieties of fruit trees that have been proved profitable to grow in this district. Nature's method of propagation is by seeds, but since, as in the case of fruit trees, this method offers no certainty of the perpetuation of the character of its parent other methods have been adopted. It is found that every branch contains under its outer covering fibre, which, given proper conditions, will develop into roots. This is especially seen in cuttings of the American plum, which roots readily, and in a lesser degree with many varieties of apples; but as the necessary condition for rooting the cuttings of many varieties would prove too expensive, grafting and budding have been adopted to give the required certainty of perpetuating the kind, and at the same time enabling us to multiply indefinitely varieties required. The method of grafting has been splendidly shown by Mr. Quinn in the back numbers of the *Journal of Agriculture* (August, 1900); also budding, November (1897); and any person of average intelligence who studies them cannot fail to become expert at both operations. Now the first thing we must insist on with our apple trees is they must have blight-proof stocks with blight-proof roots, and here it is that the man just starting his orchard or whose trees are very young meets his first difficulty. It is a fairly easy matter to obtain blight-proof scions to be used as stocks, but not so easy to obtain blight-proof roots. To get over this difficulty, I first planted the apple pips and obtained a number of seedlings, the roots from these I worked on Northern Spy wood; these made good growth, and when I took them up in the autumn I found in every instance the Northern Spy wood had thrown out roots where it had been covered by the soil. I then cut away the seedling root I had worked on and replanted the tree in the nursery bed to be budded the following season. Another method I have since adopted is to head back a tree of the blight-proof variety so that it will throw out a number of branches near the surface of the soil. These I afterwards peg down and cover with 4in. or 5in.

of soil. In the spring these covered portions will throw up a number of shoots which can be budded towards the end of the summer, and when a little later on they are cut from the branch they will be found to be rooted; they are then placed in the nursery bed for a season, when they will be ready to put out in their places. Pears as a rule will do best worked on seedling stocks, but if the position they are intended to occupy is an exposed one it will be best to keep them dwarfed.

It was the general opinion that cuttings should be put in sandy soil early in the season, care being taken to press the soil firmly round the cuttings. Mr. Nicholls showed methods of root and top grafting; Mr. Oinn illustrated saddle-grafting. It was agreed that the Northern Spy was the best all-round stock, though Irish peach was advocated for early apples.

HARES AND FRUIT TREES.—Mr. H. Simmons (visitor) stated that painting the trees with the following mixture would keep off the hares:—Add one teaspoonful of crude carbolic to two handfuls of lime, and sufficient water to make a fairly thick limewash. [A most effective wash is made of air-slaked lime, sulphur, and blood. The blood should be fairly "high," and mixed with enough lime to make a thick wash, and a little sulphur then stirred in.—GEN. SEC.]. Some papers connected with vermin-proof fencing were tabled.

Strathalbyn, August 19.

Present—Messrs. M. Rankine (chair), B. Smith, G. Sissons, R. Watt, G. M. Meikle, P. Cockburn, D. Gooch, H. H. Butler, and John Cheriton (Hon. Sec.).

CONFERENCE.—It was remarked that the day fixed for holding Conference of Hills Branches at Mylor on September 26, was the same as that fixed for the Strathalbyn Show; and, as the judges were already appointed for the show, it was desirable that the Conference should be fixed for another day.

CONDUCT OF BUSINESS.—Resolved, that in future all members shall stand up when speaking, and that each member speak in rotation.

SUMMER FEED FOR CATTLE ON THE PLAINS.—The following paper was read by Mr. John Cheriton:—

The practical and interesting paper read by Mr. G. Sissons at our June meeting, on 'Cattle-feeding in Summer,' no doubt gives excellent methods of feeding cows in the hills where peas can be grown to perfection, but for the plains it is altogether too risky. Crops I have tried, sowing late and early, have had but one result—failure. Lucern, maize, holcus, or mangold, or any green feed or roots are too precarious to depend on; what, then, is the best method to provide food for cattle during the dry season? I say, unhesitatingly, ensilage, as this can be made from anything green and succulent, such as dandelion, the natural grasses, lucern, maize, barley, oats, wheat, &c.; in fact, anything that grows is suitable for silage, but the better the quality of the stuff you make use of the better the silage. I have used it for a number of years, and have found it a splendid ration for dairy cows, keeping them in good condition and healthy. I have never any dry bible or any other disease in the cattle when fed on it, and it keeps up the flow of milk for a much longer period than would be the case if only dry herbage or even hay were used. I commence giving ensilage as soon as the natural grasses are dry two or three times a week, and, as the summer progresses and the feed becomes scarce, use it every day. When fed daily the cows become loose in the bowels, and scour more than on green grass; I then stop a day or two and give them hay, which at once corrects the looseness. One great advantage in feeding cows on ensilage is that their milk is absolutely pure and free from any taint or smell of "cowiness," which in these days of "microbes and bacteria" is no small recommendation—not that I believe in one-half that our scientists advocate. If all were true an extinction of the race of human beings would have long ago been accomplished. The milk from cows fed on ensilage is rich in butter fat, the butter is firm, not at all like that from lucern or root-fed cattle, which is soft and not free from some taint or smell. I consider, too, that ensilage is by far the cheapest and handiest feeding for cows. I have tried chaff and bran, chaff and Sunlight oilcake, and other things, but I have had better results from ensilage at less than half the cost for fattening cattle. It is only second to lucern, and I feed all my old and unprofitable cows on it after they are dry and unfit for dairying purposes, and the beef is a splendid color, and very juicy and enticing. I am much surprised that our farmers do not go in more for ensilage, as it is easily preserved, and can be made at little expense, as I will endeavor to show

from my long experience. When I first commenced I thought it necessary to have a pit dug out and walled with stone and brick all round, then plastered and cemented, and a bottom floor of concrete and cement put in; but fortunately I had a large dairy, about 8ft. underground and 6ft. above, so I set to work and cemented it all round and at the bottom. I then filled it with barley and natural grasses and lucern. I was particular in treading it down, and after filling it to get it well weighted. I laid boards as close together as possible, and on those boards I had 4ft. pieces laid across them, to keep the bags from rotting. I got 5doz. ore bags, filling them with small gravel; they then weighed about 1cwt., and if the silage sank more in one place than another I shifted a bag from the lower to the higher level, and brought it down even; then when I required to feed it to cattle I cut across the pit with a hayknife, the same as you would a haystack. I found that at each cut I lost about 3in. of stuff, as the air getting to it it mildewed it, and the cattle would not eat it. I observed the top of the cut did not mildew; the cattle were as fond of it as further in the cut. I then uncovered the whole piece I had left, and I did not lose a pound weight, even when I uncovered the whole of the pit, and I have not lost any from mildew. I used this for two years, and then I wanted to make more ensilage than this would hold, and I made a stack in the paddock, which answered very well indeed, but there was some trouble to keep it upright. I had a number of old sleepers that I used to weight the side that was highest and bring all to level. I then tried, for pressing it down, loose earth, about 1ft. to 18in. thick, and it answered admirably, and my first stack of ensilage was a success. There was more waste, however, with the stack than with the pit, so I sank a pit 16ft. deep in stockyard, and I have had it in use for about six years, and I find that the ensilage from this pit is as good and has no more waste than in the dairy that I took so much pains to cement and cover in with G.I. For the last three years I have used nothing but earth for weighting the pits, and find six inches of soil is quite enough weight to preserve the ensilage. In filling the pits or making a stack great care should be used in keeping it high in the centre and well treading all round the sides of the pit, and when it sinks from heating and pressure there will be little or no loss of silage. I strongly advise farmers on the plains to make provision for their cattle through the dry summer months by making silage, either in a pit or stack, and I am certain they will find that results will amply repay them for their trouble by the animals keeping in good health and condition, and returns being much more satisfactory.

Naracoorte, August 10.

Present—Messrs. S. Schinckel (chair), E. C. Bates, J. Wynes, J. G. Forster, H. Buck, G. Wardle, F. Welcome, A. Caldwell, H. Hassler, W. C. Hastings, and A. Johnstone (Hon. Sec.).

FERTILISERS.—A question was put at previous meeting as to whether Professor Lowrie obtains guarantees with fertilisers purchased by him; and whether on analysis he has found any deficiencies. It was now stated that an answer would probably appear in the present issue of the *Journal*. [As a practical farmer Professor Lowrie would naturally insist upon the law being complied with, and have a statement of analysis supplied with each parcel purchased. As a cautious business man he would also be careful to verify the statements furnished by the vendor.—GEN. SEC.]

ROCK PHOSPHATES.—Resolved to apply to Central Bureau for samples of rock phosphates, in order that comparisons may be made with stone found in the South-East. [We have an ounce or two of each of about twenty sorts of rock phosphates, which differ vastly in color and appearance. We have people coming every day to look at them, and about 100 applications for samples. Additionally, people from every part of the State are showering all sorts of stones into the office through the post, asking us to say whether they are phosphatic rocks. The Central Bureau cannot spare even a little piece of its small samples, and the General Secretary cannot analyse rocks, or even get anyone else to do it, unless he pays for the work out of his own pocket.—GEN. SEC.]

IMPACTION.—There was a good deal of discussion on this subject. Some supposed "remedies" were mentioned, and some causes suggested as to the origin of the complaint. Mr. Wynes hit the matter when he said he believed feed had something to do with the complaint. Mr. Forster uses molasses with the food. Mr. Johnstone considered a laxative, such as linseed oil, would be beneficial. Mr. Buck recommended long hay and molasses in preference to chaff.

CO-OPERATION.—Mr. A. Bates read a paper on "Farmers' Co-operation." [This was not forwarded with report.—GEN. SEC.] In discussion, Mr. A. Johnstone said Mr. Bates advocated co-operation in ownership of ships, wharfs, warehouses, manufactories, &c., but in the old country a great many of the co-operative companies had ultimately drifted into syndicates. Producers had taken up shares, but in time they changed hands, and they became simply large mercantile concerns. All the big wheat, wool, and produce companies had been started with producers taking up the shares; but in order to successfully compete with rivals they had to obtain capital and issue more shares. The Chairman said there could be co-operation in shipping wheat, but not in wool, because each individual's wool varies in quality and general get up, and would have to be sold by itself. There was no great scope for co-operation in this district, as the farmers' requirements were so small. Mr. Bates knew farmers had to pay too much for machinery owing to the profits made by the middle men, and Mr. Wynes knew that manufacturers sold reapers and binders for £16 for which the farmers had to pay £55, but he did not know how it was going to be altered. Mr. Bates said it could be altered by forming branches of the union and importing machinery direct from the manufacturers. Mr. Wynes questioned whether they could get it much cheaper than through the merchants. Mr. Johnstone said the manufacturers recognised that the middlemen pushed business for them and made known the advantages in using their machinery. Mr. J. G. Forster had no faith in the management of the Farmers' Union. Mr. Caldwell said the business of the Farmers' Union had to be managed by competent men on business lines. Mr. Bates said the northern farmers spoke highly of the union, but in the South-East they had not given it a fair trial. He desired to see co-operation in the purchase of all that farmers required, as well as in export and other business. There was a big ring with enormous capital in Europe to keep down the price of wool—that showed the necessity of producers co-operating.

EXHIBIT.—Chairman showed and distributed specimens of potatoes raised from several varieties that were sent out by the Chairman of the Central Bureau two or three years ago. Members will give them a further trial.

Angaston, August 17.

Present—Messrs. W. Sibley (chair), Jas. Heggie, J. H. Snell, J. E. Swann, S. O. Smith, A. Friend, A. Sibley, R. Player, and E. S. Matthews (Hon. Sec.).

CONFERENCE.—All members will, if possible, attend the Conference of Branches at Gumeracha on November 7th and 8th.

SHELTER FOR CATTLE.—The Hon. Secretary read a paper on this subject as follows:—

I divide the above into two classes—breakwinds as shelter for stock, and breakwinds for cereal and other growing crops. Regarding the former one has only to see the advantage stock take of trees, post and wire fence, or shade of any kind on hot summer days or cold and bleak winter days to at once know their importance on every homestead. To any right-thinking man it is most cruel to see, as one so often does in Australia, stock standing day after day in the full glare of a January sun, when the planting of just the four triangle corners of a paddock would have afforded the much-needed shelter. If doctors in the city think so highly of their horseflesh as to cover their foreheads with a hood when driving in the sunlight, how much more so should the farmer or grazier whose living depends on the condition of his stock. It is common enough in all districts to see cattle and sheep huddled together, heads to the ground, taking advantage of their own shadow (nothing else being available), showing only too plainly the benefit a shelter would be. The late Hon. James Martin was a most humane man in this particular, having planted during his lifetime all corners of his paddocks, also squares of same, fencing them in until

the trees acquired age, when the wires were drawn out; and his stock can now be found enjoying to the full that gentleman's forethought, and showing in their well-known condition the benefits of such wise farming. Many of us again have noticed the grand clumps of pines growing in squares on the Para Para estate, Gawler, planted in the earlier days by the late D. W. Duffield. There the wires are again drawn after a few years of growth, and stock of all kinds enjoy to the full that gentleman's care and thoughtfulness, and his stock were known to be at their best at all seasons. There are many other places where this same thoughtfulness can be seen, but on the whole the average South Australian farmer shows but little consideration for the animals which contribute so much to their future success. Planting hedges or trees for appearances round the homestead is all very well in its way, as is planting to hold drifting sandy land, &c., but these are most detrimental to all growth for chains around. I have seen much of hedges as windbreaks, much of trees planted for same, growing under all and every condition, and have only in one or two cases seen their benefit, and these only for appearance sake and as breaks to unsightly buildings or such like. In presuming to differ from many older authorities on the efficiency of breakwinds, permit me to give a few practical facts in direct opposition to this so well-accepted theory. While in charge of the Para Para gardens with my father I saw much of planting for breakwinds. The lucern paddock was bounded on four sides with a well kept and trimmed cactus hedge; the barley paddock, with olives and almonds; most of the flower garden with native pine, privet, ligustrum, pittosporum, and rose; the orange and lemon gullies, with a windbreak of planes; and to all intents and purposes they utterly failed to benefit in the way their planting intended, and took far more from the land than they have returned as breakwinds, for a chain around nothing proved satisfactory—apricots, peaches, pears, and apple—all suffered alike; the breakwinds came in for the best share of nature's bounties to the cost of the trees planted for profit. So far as Para Para was concerned the breakwind was all on the debit side. While in charge of the Hon. James Martin's Trevue estate I again found a similar state of affairs. Hedges planted everywhere, all doing well, but all plant life within a chain of same sacrificed to the breakwind. The apricots failed all along the headlands owing to the breakwinds; the vegetable life failed utterly owing to the almond, and the flower garden a failure owing to the oleander. Pepper trees around the kitchen garden sapped the life of the vegetables, and in no one case could I find a redeeming quality. I will admit, the well-trimmed ligustrum hedges looked nice, but there are many plants in our "flora" that would combine both beauty and utility better than the hedge. While in the Gawler district I noted a well kept hedge of zonalc polargonium, but even this failed in the intention; for, while it showed a well trimmed border no plant life gave the least satisfaction for many yards around, and considering the garden was small, but little profit came to its occupier. Again, taking charge of the Collingrove gardens, I found the same state of affairs—stock taking advantage of all shade, and the gardens and orchards suffering from what I am pleased to term the baneful effects of the hedge as a breakwind. One of the valley wheat paddocks was surrounded with a 30ft. hawthorn hedge, and the crop suffering for a chain or two all round; the big fire of two years ago destroyed this breakwind, and the crop no longer suffers. In my kitchen garden I have a rose hedge on one side and a privet on the other, a perfect breakwind I admit; but I was unable to grow a decent vegetable until I cut a trench 2ft. 6in. deep by 1ft. 6in. and laid old galvanized iron down to prevent its ill effects on the growing crops. Only fancy planting a hedge as a breakwind and then having to cut a trench to counteract its ill effects on growing crops. It is not very practical, to say the least. It seems to my mind to be perfectly clear that you can't grow a forest and a fruit, flower, and vegetable garden together. One has to go to the wall, and it is never the hedge, tree, shrub, or breakwind. The chief reason for thinning carrots and turnips is to avoid the effect of each robbing the other fellow; this is a simple illustration, but underlying it is the principle. I say plant breakwinds by all means if you so desire, but do not suppose they have no "after effects." My motto is each plant for itself—given sufficient room to grow and expand and properly develop before being robbed by its fellow. I regret that so many of our occupiers of the soil have so foolishly cleared their acreage as they have done, and are now turning their attention to breakwinds, whereas nature had, with more forethought, provided the same for all our wants.

In the discussion that followed, Mr. S. O. Smith said pines had ruined the trees around Yalumba. Mr. A. Friend stated that he had found poplars had the same effect, and the consensus of opinion seemed to all point to the robbing qualities of all trees as so-called breakwinds. Members were all agreed that shelter is absolutely necessary for the well-being of stock, whether in summer or winter, but the majority of farmers fail to provide any.

BREEDING SOWS.—Mr. Heggie said that breeding sows should not be too fat previous to littering. The young pigs should be quietly removed until the

littering is completed to prevent smothering, and when they are returned to the sow she should be fed all she will eat. [Authorities differ sometimes. Here is what an American pig-breeder says. GEN. SEC.] :—

For the first twenty-four hours after farrowing it is better that the sow should have nothing but drink. Do not give cold water in cold weather. Use sufficient warm water to take the chill off. For the first week a handful of bran may be added to the warm water after the first day. Clean out the pen and give a good dry bed. Gradually increase the feed, so that the sow is getting a full ration when the pigs are about a month old, then the pigs will be able to get away with all the milk she will produce. Then have a place where they can crawl to a trough of their own, and teach them to feed there.

MONTHLY NOTES.—The Hon. Secretary agreed to read monthly notes at each meeting.

TAGOSASTE.—Members consider this to be a valuable fodder plant in dry weather. [The plant called "Tagosaste" in this State is also named "Tree Lucern"; but both names are incorrect. The true Tagosaste is *Cytisus palmensis*; the true tree lucern is *Medicago arborea*, and the plant generally called here Tagosaste and tree lucern is *Cytisus proliferus*.—GEN. SEC.]

Crystal Brook, July 27.

Present—Messrs. J. C. Symons (chair), G. Davidson, W. Natt, W. Hamlyn, R. Pavy, W. J. Venning, A. Hamlyn, P. Pavy, N. Weston, and F. Keen (Hon. Sec.).

PROFESSOR LOWRIE.—A resolution expressing regret at loss of Professor Lowrie was carried unanimously.

CONFERENCE OF BRANCHES.—Matters in connection with the proposal to hold next Conference of Northern Branches at Crystal Brook were dealt with.

OFFICERS.—The retiring officers were thanked for their services and re-elected.

PAPER.—Mr. Venning read a paper on "What will make Farm Life Attractive?" and considerable discussion resulted.

Pyap, August 14.

Present—Messrs. C. Billett (chair), J. Bowes, B. T. H. Cox, A. J. Brocklehurst, E. Robinson, J. H. McGough, A. Westbrook, J. Napier, H. Mills, G. Napier, jun., J. Harrington, J. Holt, W. Axon, and W. C. Rodgers (Hon. Sec.).

PROFESSOR LOWRIE.—A resolution expressing regret at the resignation of Professor Lowrie was carried unanimously.

POULTRY COMPLAINT.—Several members reported successful treatment of disease previously reported with Condry's fluid and eucalyptus oil.

SELLING EGGS BY WEIGHT.—The Chairman initiated discussion on the question of selling eggs by weight. Mr. Brocklehurst advocated selling by weight, and pointed out that though duck eggs always fetched a higher price in the Adelaide market than hen eggs, the trading boats on the river paid the same price all round. He did not see why eggs should not be sold by weight, the same as wheat and other produce; the better the quality the higher the price per pound. The producer and consumer would both benefit by the practice, whereas at present the small eggs fetched as high a price as the larger. Mr. McGough thought the adoption of the practice would induce poultry-keepers to breed only those classes of fowls that would produce large eggs.

WATERGLASS FOR PRESERVING EGGS.—Mr Cox reported having kept eggs in waterglass for seven months, and on removing them for use he found them quite sound. He had not used them except in pastry.

TRANSPLANTING FRUIT TREES.—The question of the wisdom of shifting four-year-old fruit trees in preference to planting young trees was discussed. Mr. Cox would plant young trees. Mr. Brocklehurst had no doubt shifting the tree would shorten its life considerably; though, with irrigation at the proper time, it would be possible to obtain more fruit in a shorter time than from a new tree, even if the branches have to be cut back severely when transplanting.

Inkerman, August 20.

Present—Messrs. W. Fraser (chair), J. Lomman, A. Tozer, Jas. Sampson, C. E. Daniel, W. Board, D. Fraser, and W. A. Hewett (Hon. Sec.).

WHEAT CHAFF.—It was resolved that this Branch is of opinion that "wheat chaff" is the proper name for the so-called "cocky chaff" (*i.e.*, chaff from the winnower), and that no practical farmer will confuse it with hay chaff.

FEEDING CHAFF TO SHEEP.—Attention was called to error in previous report with respect to Mr. Fraser's experiments. Mr. Fraser fed his sheep on wheat chaff, not wheaten hay chaff.

WORMS IN PIGS.—A member wished to know how to rid pigs of worms. The animals had been well cared for and fed largely on pollard. [Give each pig about two drams sulphate of iron, and follow up with a dose of castor oil two days later.—GEN SEC.]

HORSE COMPLAINT.—Mr. Daniel reported two horses in bad condition; the hair was coming off, especially about the head; the skin was raw and the lips cracked. Members thought the animals had caught a chill.

Carrieton, August 22.

Present—Messrs. W. J. Gleeson (chair), M. Manning, A. Steinke, W. Steinke, F. Vater, and J. W. Bock (Hon. Sec.).

COST OF WHEAT-GROWING.—Considerable discussion took place on the cost of cultivating land in this district, the papers read recently at Crystal Brook Branch being criticised. Members considered these estimates too high for this district, it being thought that 15s. 6d. per acre would cover the cost. Reference was made to the failures during the past few seasons, and the hope expressed that the drought had now broken up.

OFFICERS.—Mr. Gleeson was elected Chairman and Mr. J. W. Bock re-elected Hon. Secretary.

Stansbury, August 3.

Present—Messrs. A. Anderson (chair), P. Anderson, G. Henderson, C. Faulkner, J. Germein, and P. Cornish (Hon. Sec.).

GRUBS IN CROPS.—Mr. Faulkner reported that the grubs of the small beetle were amongst the crops again this season, and in some cases were doing much damage.

CASTRATION OF COLTS.—In answer to questions, Mr. Faulkner said he had operated on a good many colts. The best time to do it is in spring, when danger of frost is over, during fine weather, when there is generally plenty of feed about. There should be a good bed of straw where the colt is thrown,

and there should be plenty of hands about, so that there shall be no unnecessary struggling, and when the operation is completed the colt should be allowed to walk quietly away.

ROCK PHOSPHATES.—Members desire to secure samples of rock phosphates for comparison with lithological formations in the district. Also samples of super. made from various rock phosphates for trial.

FARM RETURNS.—The Hon. Secretary read the following paper:—

My object is to show the actual results from my farm during the past four years, with the hope that it may encourage others. These results have not been obtained by high-class farming or by a system of fallowing or working the land. My land has been treated every year in the same way, viz., ploughed after the rains have come, and the land softened (I do not find it good to plough in dry weather) and well harrowed before and after the drilling of the seed, &c. During the four years I have sown very little broadcast, as it will not pay without manure; in 1899 I sowed a piece of new land broadcast, but the result was disappointing, as it only yielded about 3bush. per acre; in 1897 all my wheat was sown late for various reasons, but the return was very satisfactory, being over 14bush. per acre, while my next neighbor, who did not use the drill or artificial manures, reaped only about 3bush. per acre; in 1899 the crop blighted very much, and I only reaped about 9bush. per acre. During the past two years I have grown Cape oats with very good results. That portion reaped yielded over 20bush. per acre, and that cut for hay yielded, in 1899, about 1 ton per acre, and last year 2 tons per acre. These were sown broadcast without manure on land that had been drilled into wheat the two years previous. Those in 1899 were drilled in with about 80lbs. of the Sugar Refining Co.'s superphosphate. As regards manures, I have not tried many kinds, Sugar Co.'s, guano super., and Lawes' superphosphate being the only manures used. The following figures show the result in averages for each year, the quantity of seed in each case being about 40lbs. per acre:—

		Quantity Used.	Average per Acre.
1897.	Sugar Co.'s super.	90lbs.	14bush.
	Guano super.	112 "	10½ "
1898.	Sugar Co.'s super.	90 "	16 "
1899.	Sugar Co.'s super.	90 "	8 "
	Lawes' super.	90 "	12 "
	Unmanured.	—	3 "
1900.	Lawes' super.	90 "	13 "

These returns I consider very good, taking into consideration the fact that this has been during some of the driest seasons known in this State. This season I have again used Lawes' superphosphate and guano super., and the crop is looking well. I consider that the artificial manures have been the making of the Peninsula, and by a careful selection of manure and a proper system of working the land, with fair seasons, we shall yet see still greater returns. I do not think it at all advisable to sow wheat on same land two years following, using same kind of manure, but if sown one year to wheat and the next to Cape oats I find to be the best.

In answer to questions, the Hon. Secretary said in growing wheat two years successively on the same land he would use Lawes' super. the first year and guano super. the next. The best results would be secured on early fallow, worked in spring to kill weeds, then sow clean seed wheat, not too early, for the first year, and Cape oats the next year for a good crop of hay. Several members mentioned the good results in quality and quantity of grass on fields that have been treated with superphosphates.

Paskeville, August 24.

Present—Messrs. A. Goodall (chair), H. Koch, W. Curnow, A. C. Wehr, A. Palm, J. P. Pontifex, G. Meier, J. G. Price, P. A. Blackman, and W. S. O'Grady (Hon. Sec.).

FIELD TRIAL.—It has been agreed to invite makers and importers of harvesting machinery to give practical demonstration of the capabilities of their implements—especially of the new combined harvester—at a locality near to Paskeville, some time during November, the trials to be under the auspices of the Northern Yorke's Peninsula Show and Field Trials Society. No prizes to

be given; no judges—each farmer to form his own opinion. The Paskeville Branch will provide teams to work the machines, and will bring any machines on to the field from the station and return them when the trials are over.

PHOSPHATE ROCK.—Mr. Pontifex said he had visited the phosphate beds at Clinton, and he tabled some specimens, which were regarded as instructive. Mr. Barton has about 100 tons raised already.

PROGRESSIVE IMPROVEMENT IN AGRICULTURAL IMPLEMENTS.—Mr. J. P. Pontifex read a paper entitled "Recollections of My Younger Days; or, Revolution in Farming Implements," in which he dealt with the old wooden plough, cultivators, flails, sickles, &c., and referred to the great improvements in all classes of farm machinery and implements up to the present day. The subject was interesting in an historical sense, and sometimes amusing.

Port Germein, August 24.

Present—Messrs. G. Stone (chair), E. McHugh, J. K. Deer, P. Hiram, W. Holman, W. Head, C. O'Loughlin, and A. H. Thomas (Hon. Sec.).

CHANGE OF SEED WHEAT.—The Chairman initiated a discussion on the advisableness of obtaining a change of seed from another district, and suggested that Yorke's Peninsula might be a suitable locality from which to obtain seed. It was resolved to obtain information concerning the varieties grown there, and to obtain seed of the best for trial.

IMPROVING BUREAU MEETINGS.—Mr. McHugh considered it would add to the benefits derived from the Branch meetings if members, when reading their *Journals*, would make notes of papers read or suggestions made at meetings of other Branches, and bring them forward at their own meetings.

HORSE COMPLAINT.—Mr. Head stated that a number of horses in the district were suffering from some complaint, the symptoms being very similar to complaint prevalent in Quorn district. It was resolved to write to Quorn for information as to treatment found beneficial.

Minlaton, August 24.

Present—Messrs. J. Anderson (chair), A. McKenzie, J. McKenzie, Jas. Anderson, D. G. Teichelmann, H. Boundey, W. Honner, and J. D. Mayer (Sec.).

SAND IN HORSES.—Mr. J. Anderson and other members said, in answer to Mr. Darling's question *re* sand in horses, that they had tried, and used with success, coffee and milk, warmed and mixed to the consistency of gruel.

IMPROVING THE WORK OF THE BRANCH.—Mr. J. McKenzie read a paper on "How to Make the Best Use of our Meetings," as follows:—

As the Bureau is a Government institution or worked at the expense of the general taxpayer, and all its members are more or less taxpayers, it is the duty of every Branch and every member to try to do something for the benefit of the country through the Branch to represent the amount of money expended on his Branch. If we did this we would have better and more attractive meetings. When we get the *Journal* every month, we look at the reports of different Branches; in some cases there are good reports, in others we see from two to four lines, and this represents a contribution from the Branch for about fifteen copies of the *Journal* sent free to the members, besides post cards for notices, &c. Other places you look for; there is no report at all. People sometimes asks us how it is there is no report of the last meeting in the *Journal*? Well, you ask the secretary of the Branch, and he will tell you "There is nothing to report." It would be much more satisfactory for a secretary to have a good report and a paper to send to the General Secretary than to have to report the presence of four or five members and little or no business, or, as sometimes is the case, no meeting. Now, this is just about what it is come to, and we cannot get away from the fact that we are

taking the *Journal* every month and other incidental expenses without contributing what is our just right, and what other branches of the general public expect of us. Now for a suggestion as to how this state of things could be easily altered and our meetings be made more attractive, and a benefit to ourselves and to others. In the first place I am sure there is not one of our members but could write a very fair paper on various subjects of interest, or open a good subject for discussion by the Branch; therefore I should like to make it compulsory that every member in turn, write, or cause to be written, a paper, or open a subject for discussion at the meeting when his turn came. The subject to be given to the secretary at a previous meeting, and be stated so that all members could think it out and come prepared to discuss it at the next meeting. There would be plenty of time for correspondence and other business of importance, and we could have a paper or subject under discussion at every meeting. I feel sure if we tried this plan we would have better attendance and more attractive and instructive meetings, and not only help ourselves, but by helping ourselves we would help others. [The General Secretary says "Hear, hear" to Mr. McKenzie's remarks. Too many members fail to recognise their responsibilities in this matter. If a member does not feel competent to prepare a paper, let him read some paper from a previous issue of the *Journal* and criticise it. Members who read papers would generally be glad of criticisms from other Branches. If the member has any fault to find with what has been advocated in any other member's paper, let him say so, and give his reasons for his criticism. This also applies to papers read at your own meetings; it is most unsatisfactory for a member to prepare and read a paper and then find none of his fellow-members think it worth discussing.—GEN. SEC.]

Bowhill, August 28.

Present—Messrs. J. T. Gregory (chair), A. Dohnt, sen., E. P. Weyland, N. P. Norman, E. Drogemuller, F. H. Baker, W. Towill, J. Waters, F. A. Groth (Hon. Sec.), and three visitors.

FARMING.—Mr. Towill advocated the use of the seed drill in this district and the application of mineral super. at the rate of 70lbs. to 80lbs. per acre. Mr. Drogemuller advised pickling seed wheat in tar water to protect it against birds. About 1½lbs. of tar is dissolved in sufficient hot water to moisten a bag of wheat, the pickling being done the same as with bluestone. It was stated that Thomas phosphate could be used in the same way and at the same time manure the plant.

Mylor, August 24.

Present—Messrs. W. J. Narrowway (chair), W. Nicholls, J. Nicholls, E. Hayley, W. H. Hughes, F. G. Wilson, E. J. Oinn, C. Nielsen, T. J. Mundy, F. R. Newberry, J. Smith, J. Roebuck, W. G. Clough (Hon. Sec.), and eight visitors.

HOMESTEAD ORCHARD AREAS.—Mr. E. Wilson, Inspector of Homestead Blocks, read the following paper on this subject:—

In a paper read some time ago I briefly touched on the obvious advantages of some form of co-operation in the orchard industry, particularly in this neighborhood. Our climate and a considerable portion of our land are suitable and second to none in the State for the cultivation of many kinds of fruit, especially the apple, which is likely to become increasingly an article of export. But we are hampered to such an extent by our want of capital that what would, by our unaided efforts, take generations to effect could, by the judicious use of sufficient capital, be brought about in ten years. There are some 250 blocks in this group; if only 100 of these were combined, and five acres selected from each and planted with apples, in ten years they would yield something like \$10,000 to the annual wealth of the community, and an income of about \$90 for the owner of each five-acre area, of course quite independently of any income derived from the remainder of each block, which would remain as at present, absolutely under the control of the lessee. I have no doubt this matter has occupied the minds of or has occurred to the members of the Branch and others, but I would like to bring the matter to a head by asking the members and other blockholders through them—1. Whether they think it would be to the advantage of this district to have 500 acres of orchard in good heart and full bearing in ten years' time? 2. Whether it would benefit the individual blockholders if some scheme could be devised by which the necessary capital could be obtained from the Government to establish such an orchard? 3. Whether, in the event of a fair and workable

scheme being devised, any number of blockers from twenty-five to 100 would be willing to take advantage of it? Some such scheme as here outlined might be suggested:—Let a committee of expert and practical men be appointed to go over the land with the blockers and select the area suitable from each block. Let each lessee make over to the Government for the term of ten years such selected area to be cleared, fenced, grubbed, and planted. Let the work be done under the control of the Government, supervised by a competent person or persons, whose duty it would be to see that every part of the work is properly and faithfully carried out. Let every blocker concerned in the area have the right to employment on the work so long as he was found suitable and did his duty by his fellows. Let all employed be paid a fair wage for the work done. Let the work be done in such a way that an equal area shall be planted each season on every block. At the end of ten years let the indebtedness of each participant blocker be ascertained, and a mortgage taken by the Government for the amount as security for the repayment, the mortgagors agreeing to pay interest at the rate of, say, 4 per cent. per annum, and to repay the principal in instalments of not less than £6 per annum, payable half-yearly or yearly. I have used the word "blocker" so as to include lessees and those who may have completed the purchase of their holdings. If the members of the Branch think that there is a prospect of a practical outcome in this direction, I am prepared, if desired, to submit a more detailed scheme.

After some discussion it was decided to call a public meeting and ask Mr. Wilson to further explain his scheme.

Woodside, August 26.

Present—Messrs. R. Caldwell, M.P. (chair), W. Rabach, G. F. Lauterbach, R. W. Kleinschmidt, R. P. Keddle, C. W. Fowler, A. Lorimer, and A. Hughes (Hon. Sec.).

WEATHER FORECAST.—The Chairman read an interesting paper on "The Possibility of Forecasting the Weather."

Rhine Villa, August 24.

Present—Messrs. G. A. Payne (chair), F. F. Payne, R. Payne, W. Start, H. Mickan, W. Farey, and J. W. Vigar (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary's report showed that eleven meetings had been held during the year, with an average attendance of seven members out of eleven on the roll. Six papers have been read, and many subjects of practical interest discussed. Messrs. G. A. Payne, H. Mickan, and J. W. Vigar were re-elected Chairman, Vice-chairman, and Hon. Secretary, respectively.

Lucindale, July 27.

Present—Messrs. E. Feuerherdt (chair), S. Tavender, A. Matheson, G. C. Newman, A. Carmichael, W. Dow, L. McInnes, J. McInnes, and E. E. Dutton (Hon. Sec.).

RAINFALL.—For June, at Conmurra, 5.41in.; for July, to 26, 1.60in. Stock healthy; crops backward.

FOXES.—Mr. Newman gave instances where foxes have attacked sheep. Mr. Carmichael doubted whether foxes would keep rabbits from increasing; he had seen more rabbits this season than ever before. The Chairman said foxes were a bad pest, and were becoming increasingly numerous.

THE EARTH WORM AS A SOIL IMPROVER.—Mr. B. A. Feuerherdt read the following:—

At our last meeting the ruin worm or common earth worm was mentioned by one of our members as being a nuisance, in that it devoured all the farm yard manure with which a plot of vegetables had been manured and the member seemed afraid that in consequence his

vegetables would be a failure. At the time being I did not feel sufficiently enlightened on the subject to discuss it deeply. Fortunately our local library contained a volume by Professor Henry Drummond which gives us some interesting information. He says:—

"When we watch the farmer at work and think how he has to plough, harrow, manure, and humor the soil before even one good crop can be coaxed out of it, we are apt to wonder how nature manages to secure her crops and yet dispense with all these accessories. The world is one vast garden, bringing forth crops of the most luxuriant and varied kind century after century, millennium after millennium. Yet the face of nature is nowhere furrowed by the plough; no harrow disintegrates the clods; no lime or phosphates are strewn upon its fields; no visible tillage improves the work on the great world's farms. Now, in reality there cannot be crops, or successions of crops, without the most thorough agriculture; and when we look more closely into nature we discover a system of husbandry of the most surprising kind. Nature does all things unobtrusively, and it is only now that we are beginning to see the magnitude of the secret agricultural operations by which she does already all that man would wish to imitate, and to which his most scientific methods are but clumsy approximations. In this great system of natural husbandry nature uses agencies, implements, and tools of many kinds. There is the disintegrating frost, that great natural harrow which burets asunder the clods by the expansion during freezing of the moisture imprisoned in their pores. There is the communistic wind, which scatters broadcast over the fields the finer soil in clouds of summer dust. There is the rain, which washes the humus into the hollows and scrapes bare the rocks for further denudation. There is the air, which, with its oxygen and carbonic acid, dissolves and decomposes the stubborn hills and manufactures out of them the softest soil of the valley. But this is not all, nor is this enough. To prepare a surface film however rich and to manure the soil beneath will secure one crop, but not a succession of crops. There must be a mixture and transference of these layers and a continued mixture and transference kept up from age to age. The lower layer of soil exhausted with bringing forth must be transferred to the top for a change of air, and there must be for a long time, increasing its substance and recruiting its strength among the invigorating elements. The upper film restored, disintegrated, and saturated with fertility and strength must next be slowly lowered down again to where the rootlets are lying in wait for it deep in the under soil. Now how is this last change brought about? Man turns up the crust with the plough, throwing up the exhausted earth and down the refreshed soil with infinite toil and patience. Nature does it by natural ploughmen, who with equal industry are busy all over the world reversing the earth's crust, turning it over from year to year, only much more slowly and much more thoroughly, spade by spadeful, foot by foot, and even grain by grain. Before Adam delved the Garden of Eden these natural agriculturists were at work, millions and millions of them, all over the world at different seasons and in different ways tilling the world's fields. According to Mr. Darwin the animal which performs this most important function in nature is the earth worm. Mr. Darwin calculates that the whole soil of the country must pass through their bodies every few years. Some of this earth is brought up from a considerable depth beneath the surface, for in order to make its subterranean burrow the animal is compelled to swallow a certain quantity of earth. It eats its way, in fact, to the surface, and there voids the material in a little heap. Although the proper diet of worms is decaying vegetable matter, dragged down from the surface in the form of leaves and tissues of plants, there are many occasions on which this source of aliment fails and the animal has then to nourish itself by swallowing quantities of earth for the sake of the organic substance it contains. In this way the worm has a twofold purpose to throw up earth—first, to dispose of the material excavated from its burrows; and secondly, to obtain adequate nourishment in times of famine.

"When we behold a wide turf-covered expanse," says Mr. Darwin, "it is a marvellous reflection that the whole of the superficial mould over any such expanse has passed and will pass every few years through the bodies of worms. The plough is one of the most ancient and valuable of man's inventions; but long before he existed the land was, in fact, regularly ploughed by earth worms. It may be doubted whether there are many other animals which have played so important a part in the history of the world as have these lowly-organised creatures."

In the light of Professor Drummond's remarks the member was very likely quite justified in saying that the worms had devoured all the farm yard manure, but when he accused them of robbing the plants, or of their presence being detrimental, I think he was doing the earth worm an injustice. Although the manure may apparently be all gone, still I am confident that over 96 per cent. of it will still be there, but in an invisible form, and, what is more, in a form infinitely more adapted to the requirements of plant life than in its previous state. In passing through the digestive organs of the worms it has become so finely divided that it cannot be distinguished from the rest of the soil, and being in this finely-divided state will yield up its manurial ingredients much more readily than if left to decay in the usual way. Now, it may be argued that in their burrowings the earth worms may disturb the root system of the plant, which to a small extent they must

do, but on the other hand let us take for example the common process of "hilling up" potatoes, or the summer cultivation between growing crops. In these operations we must destroy thousands of rootlets, but the benefit which the plants derive through this stirring of the soil more than compensates them for the damage done to their roots. Again it may be argued that in the process of digestion the worm may extract all that is useful from the manure. I think not. The horse or ox retain less than 4 per cent. of the manurial ingredients of the food supplied to them. The other 96 per cent, or more, eventually finds its way back to the land in the form of farm yard manure. This being the case it seems only reasonable to suppose that an organism, which has neither animal heat to maintain, nor bone tissue to build up, would retain less still. Even supposing they did absorb some fair amount of its nourishment, what are they to do with it? They are fortunately not provided with wings that they might fly away with it. Their life is a short one, and at the end of it they lay a few eggs to provide cultivators for next season, and then yield up their humble carcasses to the soil in return for what little they may have borrowed from it.

Wilson, August 24.

Present—Messrs. W. H. Neal (chair), H. Need, T. Matthews, and J. Nelson.

OFFICERS.—Mr. H. Need was appointed Hon. Secretary in place of Mr. A. Canning, who has left the district.

WATERING HORSES.—A discussion on this subject took place. Members were agreed that light and heavy horses required different treatment. The former should not be watered just before going on a journey, while the latter might be given a drink at any time.

Riverton, August 3.

Present—Messrs. W. Hannaford (chair), T. Gravestocks, M. Badman, W. Davis, Dr. Glynn, and H. A. Hussey (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary's annual report showed that during the year one special and ten ordinary meetings had been held, the average attendance being eight. Three papers had been read, a number of practical subjects discussed, and a lecture arranged for Mr. G. S. Thomson on "Best Breeds for Dairy and Management of Dairy Stock," which proved interesting as well as instructive. The district had been fairly free from pests and diseases; two or three undesirable weeds had come under notice, and had been dealt with in the interests of the producers. On the whole, the Branch had done good work, The Chairman and Hon. Secretary were thanked for their services, and re-elected for ensuing year.

Lipson, August 24.

Present—Messrs. G. Provis (chair), J. Brown, J. Provis, Chris. Provis, S. F. Potter, Caleb Provis, H. Brougham, A. B. Wishart, J. McCallum, Geo. Carr, E. J. Barraud (Hon. Sec.), and one visitor.

EXHIBITS.—Mr. Chris. Provis tabled a plant of Newman wheat, sown May 17th, manured with $\frac{1}{2}$ cwt. superphosphate, and standing 3ft. high; also Beauty of Hebron and Circular Head potatoes. Mr. Caleb Provis tabled plant of Grey's Early wheat, 4ft. 6in. high, sown April 2nd; also a pie melon, 35lbs. weight.

PROF. LOWRIE —Members expressed regret that Prof. Lowrie is about to leave the State.

CABBAGE APHIS.—A remedy for this pest was said to be to spray with a solution of soft soap. It was also said that stimulation with plenty of water and liquid manure at the roots will largely prevent injury from cabbage aphids.

Woolundunga, August 12.

Present—Messrs. J. Greig, T. H. Prosser, N. J. Rogers, J. H. Michael, J. H. Moseley, J. Grunike, J. O. Walker, H. Aldenhoven, N. Rogers (Hon. Sec.), and two visitors.

ECONOMY IN FARMING.—Mr. H. Aldenhoven read the following:—

How can we practice economy in farming? Can we obtain the desired result by doing as agricultural writers have repeatedly told us to do? *i.e.*, (1) grow all produce needed for the use of the household on the farm; (2) refrain from feeding our paddocks too bare in the early part of the season, *i.e.*, always preserve enough old dry feed to carry stock well into the ensuing winter.

The advice seems seasonable enough if given to farmers who reside where summer and winter come round as regularly as the sun and moon, but to farmers residing in districts where the summers generally come round disastrously early, and where the winters are of very short duration, if, indeed, they come at all, the advice in question is absurd. For if I can grow a fat lamb, worth 10s. 6d., at quarter the expense it costs to produce a hundredweight of potatoes, buyable at 6s. or 8s., it would be poor economy to even try and produce the potatoes. Therefore, let us produce what we can produce with profit, and exchange that product for the other which can be raised in other districts with more favorable results than in our own. That, it seems to me, is true economy. As regards the saving of old dry feed. It would be absurd to attempt to do so in this district. It would be the reverse of economy to save our herbage until it gets dry, and then have it swept out of existence by the terrific east or north winds.

I will give you an instance in support of the foregoing remarks. Last year I heard one farmer say to another, "I have far better feed in my paddocks than you have in yours!" "Oh, have you!" replied the other. "Well, I've got my feed in my pocket, the place where your feed won't get to." This really proved the case; for when, some weeks later, after a strong east wind, I crossed the paddocks referred to, I saw that hundreds of acres had been swept as clean as a concrete floor. I came to the conclusion that the man who had his feed in his pockets was the more economical farmer of the two. If ever we have an opportunity to store or preserve feed for the time of scarcity, by all means let us avail ourselves of it. Do not waste "cocky-chaff" or straw; for in cold weather it will be eaten readily by all stock—even when there is plenty of green feed in the paddocks.

Most farmers in this district entertain the idea that manuring the land causes all vegetation to blight off with the first hot winds. I have seen some of our best farmers waste hundreds of tons of horse and cattle dung by carting it into some gully or out-of-way place, and there burning it. This manure should have been taken into some bare ground where it would soon have caused something to grow, or carted into some sand drift, where it would help to bind the sand. Even if the idea were correct I think that the farmer who had kept his feed in his pocket would soon reap the profit of the rank growth of herbage, grass, wheat, or whatever it might be; he would not give the hot winds a chance to scorch it off. I have not said anything about producing grain, for I consider a grain crop, in this district, a chance crop only—except where the land gets flooded during the winter; and even then it will pay better to cut the crop for hay to be disposed of in the shape of chaff, beef, or mutton. We may sum up the foregoing in the following few words: Let nothing, that will raise the carrying capacity of your holding go to waste. Make the most of what you are able to grow during the winter months.

Mundoora, August 23.

Present—Messrs. R. Harris (chair), T. Wall, W. J. Shearer, D. Owens, C. Button, W. Aitchison, J. Blake, D. Smith, H. Torr, W. Mitchell, J. J. Vanstone, J. Loveridge, H. Hains, A. E. Gardiner (Hon. Sec.), and one visitor.

WALLAROO SUPERPHOSPHATE.—Mr. Vanstone, referring to an opinion formerly held by himself, said he had since learned that this super. is quite fine enough and sufficiently soluble for all purposes; in fact, his crops were looking better with 14lbs. per acre less than was used of imported super. on adjacent land.

STAR THISTLE.—Members are agreed that the star thistle is not good food for sheep, as was asserted by a member of Morphett Vale Branch. Their experience has taught them that it is quite worthless, and ought to be destroyed. [Perhaps the soil is deep and rich and the rainfall good at Morphett Vale, causing a more succulent growth of this weed.—GEN. SEC.]

THE LATE MR. C. H. SMITH.—Members regret the death of Mr. C. H. Smith, of Ardrossan, who, by the invention of the stump-jumping plough, conferred great benefit on farmers occupying newly-cleared scrub and stony land.

FALLOW.—When is the latest time to finish laying up land in fallow? Mr. D. Smith considers the middle of August as late enough. The Chairman would extend it into September, when there is much to do. Mr. Loveridge last season kept teams going from seeding to hay-making, and cannot see any difference in the crops up to the present. Mr. Button has some of his best crops on land that was fallowed in September last year. The reason, he thinks, is that there was moisture in the soil and the green stuff that was turned under has acted as a fertiliser. The conclusion arrived at was that in some seasons, when late rains occur, especially on sandy land, fallowing may be carried on later than when the contrary is the case.

Caltowie, August 26.

Present—Messrs. L. Graham (chair), G. Noonan, J. H. Both, J. G. Lehmann, A. McDonald, F. Lehmann (Hon. Sec.), and one visitor.

BUSINESS.—A lot of routine and formal business was transacted. The attendance was limited in consequence of rain. Decided to make annual levy of 6d. per member for incidental expenses.

Richman's Creek, August 26.

Present—Messrs. W. Freebairn (chair), A. Knauerhase, J. M. Kelly, J. H. Lehmann, and J. McColl (Hon. Sec.).

RAIN.—Owing to rain the attendance was meagre; the reading of a paper by the Hon. Secretary was postponed.

Port Pirie, August 24.

Present—Messrs. P. J. Spain (chair), G. Hannan, W. Smith, T. Gambrell, W. K. Mallyon, T. Jose, G. M. Wright, E. J. Hector, T. Johns, J. Lawrie, T. A. Wilson (Hon. Sec.), and four visitors.

LUCERN.—Mr. Mallyon sowed Hunter River seed of lucern in August last year. The plants just lived through summer, but now the field is luxuriant. The soil is of a sandy nature.

NEXT CONFERENCE.—The Chairman of Gladstone Branch reported that a majority of the Branches usually represented were in favor of holding the next Conference as usual at Gladstone.

FORESTS AND RAINFALL.—In discussing Mr. Jose's paper on this subject, Mr. Johns doubted if forests had any influence on rainfall, and mentioned that Hill River, Gulgare, and Caltowie has little timber but a sure rainfall. Parts of New Zealand are treeless, but very wet. Our West Coast has plenty of timber, but little rain. Timber is increasing around Adelaide, but rain is decreasing around Adelaide and Mount Crawford. Mr. Mallyon contended that timber does not mean moisture, and cited Queensland, where there has been a most severe drought, and yet that is a timbered country. Mr. Hector thought a good deal might be said on both sides. The aridity of parts of Spain, India, Mauritius, America, and Central Africa was attributed to denudation of forests, yet the extensive plantings of trees in Egypt did not increase the rainfall. [Fifty years ago the average number of days during which rain fell during the

year on the delta of the Nile in Egypt was four. After the Khedive had established several millions of trees, the number of days in which rain occurred during the year increased to forty.—GEN. SEC.] It was, however, a great mistake to destroy all the trees in a sandy country.

LICE ON PIGS.—Mr. Johns asked what remedy should be adopted for lice on pigs. Mr. Jose had cured some pigs by rubbing them over with a mixture of oil and kerosine. [The sties should also be well sprayed with Calvert's carbolic.—GEN. SEC.]

HOW WARD'S PROLIFIC WHEAT ORIGINATED.—Mr. Lawrie said the late Dr. Schomburgk sent out small parcels of a wheat called DuToits, and he (Mr. Lawrie) divided his parcel with Mr. Ward. At harvest time it was seen that there were two kinds. The DuToits rusted very badly, and was worthless. Mr. Ward saved all the strange heads which were not rusty, and resowed the seed. This he named "Ward's Prolific."

STRAY NOTES ON WHEAT.—Mr. Kahlbaum read the following paper:—

Botanically speaking, wheat belongs to the great family of grasses, this family being divided into a large number of species and including many forage plants as well. All our food-producing cereals as wheat, rye, oats, rice, maize, and barley, are nearly related to each other in a botanical sense, while their chemical composition is such as to cause their grains to be used as food all over the world. It is fairly certain that wheat has formed one of the earliest cereal foodstuffs of mankind. Apart from its being mentioned as such in the earliest writings of our Bible and ancient history generally, wheat grains have been found together with the stone implements of prehistoric man. It is a matter of common knowledge that the tombs and pyramids of ancient Egypt contain wheat grains, which, by the way, are closely related to a species known to-day as "English wheat." It is related as a fact that in the 16th century a man succeeded in propagating from grain stored away for thousands of years a species which is known by the name of "Mummy wheat" or "Pyramid wheat." Further proof of the antiquity of this cereal lies in the fact of its being found in the refuse heaps deposited in the beds of the lakes of Switzerland and upper Italy by prehistoric man, who dwelt in houses erected upon piles in those lakes. It is, perhaps, due to the antiquity of the wheat plant that we have no other cereal under cultivation which exhibits such a variety of types. Types, too, whose botanic relations have parted so far from each other as to stamp them as artificial crossbreds, hybrids, that is in a sense as to make them unfit for self-production and therefore for propagation, though, as Mr. Farrar and Mr. Marshall contend, it is no real difficulty to artificially crossbreed wheat and macaroni wheats. The offspring, however, in many instances behave like the hybrids above mentioned. I see in this phenomenon a proof of the antiquity of the plant, for the time when the two species parted must lie far behind us. To estrange their offsprings to the extent of inability to propagate means indeed a far-off relationship in plant life. Before going any further I wish to deal briefly with the botanical classification of the wheat. The so-called true wheats include four species, viz., the common or bread wheat, English wheat, hard or macaroni wheat, and Polish wheat. The other species or spelt wheats comprise three—spelt wheat, runner spelt, and horse spelt. The wheats which are of importance to Australia belong almost exclusively to the species known as "bread wheat," the cultivation of "macaroni" or "English" wheats being of very secondary importance, while spelt wheats are not grown here at all. The variation of type in the wheat plant is marvellous, the difference in the nature of the endless varieties being such that it is no easy matter to discern between even a limited number, but when it comes to counting the sorts by the thousands, as many institutions are cultivating them for experiment, it is indeed puzzling how men are able to get through the lot. When Mr. Farrar told me two years ago he harvested and threshed over 1,000 varieties of wheat I could but express my astonishment as the carrying out of such a Herculean task. Further, there is no culture plant which permits of its growing under the most adverse circumstances as well as the most favored of conditions—from down south, with its bountiful rainfall, to the dry arid north, the wheat is the plant upon which the tiller of the soil may count with anything like certainty to get a return. And how wonderful, indeed, is its adaptability to circumstances and condition to survive. And not only to survive, but to find energy enough to propagate the species and feed man and beast besides. We all have seen - I dare say far too often—the severe struggle that takes place when droughty conditions set in, compelling the wheat plant to prepare for the fight for its existence. Supposing the wheat had a fair start after seeding, and the roots have gone well into a soil saturated and made friable by moisture, it has been enjoying a luxurious growth and covered itself with plenty of flag, thus ensuring for its well-being a superabundance of breathing space. First of all this breathing surface is curtailed when drought begins to set in. The plant accommodates itself to the prevailing conditions, and simply dispenses with the superabundance of lungs and sheds the lower leaves. Does it find itself encumbered with still too much flag, or are the flags—the result of happier days—encouraging evaporation,

the plant does not hesitate to get rid of them and replace them with smaller and narrower ones. Flax and sheaf eventually assume a bluish appearance, the result of a kind of varnished coating. This waxy matter is to protect the plant from the fierce rays of the glaring Australian sun. And so continuing in this work of self-preservation the wheat will sacrifice almost every part of its own self, all the leaves, sheaves, and part of its head, in order to concentrate all its energy upon a grain or two to propagate the species. I do not touch upon the fight between the individual plants themselves, because this again is another feature of the severe struggle, and a most deplorable one. Plant after plant will go down, the weakest naturally succumbing first, leaving eventually the battlefield to the fittest to survive. And what that means under unfavorable conditions everyone present knows—perhaps by reaping 40lbs. off where he had sixty sown. This may be thought to be somewhat exaggerated, but I just wish to show what a marvellous vitality and power of accommodation to circumstances lies embedded in the plant. As I said before, there is no culture plant which is split up into so many varieties with distinct features as the wheat. Every farmer knows what an effect weather conditions may have upon the look of a wheat field. A month very often seemingly changes a variety into another one. Of a dark-green color and a vigorous growth to-day, four weeks hence may show us a steely-blue struggling mass of stems, which seem to belong to another variety altogether. By this ease of accommodating itself to climate and soil new species are constantly being born, which simply reflect in themselves those conditions under which they have been bred. It is a remarkable fact that while mild Australian wheats—purple straw sorts—sown for a number of years in Hungary and Russia develop hard red grains of much higher baking value than their parents from Adelaide. Further, the small spikelets we notice upon the heads of our purple straw sorts grow into quite remarkable spikes in the same country. So we see the grain turning red and hard and the heads bearded. It is said that wheat will develop beards in order to protect the heads from knocking their grains out in stormy windy weather, but I feel inclined to doubt this assertion. If purple straw wheat develops long spikes in Europe, surely our climate is boisterous enough for it to do the same here. I dare say all those present recollect the introduction of Ward's Prolific. When this variety was first cultivated its grains were decidedly flinty and harsh. I have a lively recollection of the time when it began to be forced upon us—about 1887. I have been assured by some farmer friends that when Ward's commenced to be cultivated round Pirie its time of development was fully a fortnight longer than at present. Whether such is really the case some of those here this afternoon may be able to say, but in any case I know from practical experience that the grain has materially altered. It has become more mallow and has lost its dirty reddish appearance, and there can be no doubt that Ward's constitutes a different variety to-day. A quite remarkable feature of this sort is contained in the fact that the soil conditions of Terowie, Pirie, and the adjoining hundreds seem specially adapted to the proper maturing of this wheat. In no other district in South Australia have I seen Ward's in such perfection, while this sort grown in New South Wales compares very poorly with that grown here. It is related to me that Mr. Ward raised this sort from a stray grain of Egyptian wheat which he received from Mr. Molinoux. Mr. Farrar says in regard to this matter—"Ward's Prolific, although it is undoubtedly a distinct variety, resembles Rousselin, which is a pronounced variety, of French origin, with long ears and a remarkably cup-shaped habit of growth." Now, my opinion in regard to this matter centres in the idea that Ward's Prolific as a distinct variety is the happy result of circumstances. I think Rousselin sprouted, and, finding conditions congenial, developed into a species of a certain fixed character. A further proof of my contention I see in the statement of Mr. Marshall—"You may make anything out of Ward's." Some of his sorts have been selected from Ward's, and the remarkable rust-resisting qualities of some of his pedigree wheats have been inherited from this variety also. To what extent the said variety has permeated the blood of our northern wheats I do not think has ever been fully realised. Budd's Early, Carmichael's Eclipse, and Gluyas represent some of the most important of Ward's offsprings selected up here, and these are said to be natural crosses. Budd's, they tell me, is the result of Ward's and Allora Spring, which contention, however, I doubt very much for the reason that Budd's was in the field long before Allora Spring was cultivated in the North. It is only of late years that Allora has attracted the attention of farmers up here. Though Dr. Cobb, of Wagga, includes Budd's amongst the Allora group, I am not convinced of this being correct. As to Carmichael's and Gluyas they are said to hail from the same parent—Ward's and Velvet Pearl. I should like to know whether they were cross-fertilised or are the result of supposed natural crossing. I wish to submit to the meeting a very small sample of a wheat which Mr. Farrar was good enough to grow for me. It is Ward's and Velvet Pearl, and the experiment was made with the idea of seeing whether Carmichael's really constitutes a cross or a sprout from Ward's. The grains you see here show nothing of the Ward's original type. The results of the crossing were three species, two with Velvet Pearl grains and one with Ward's grain, the latter being rejected as not meeting the case. You will admit that the Velvet Pearl character is expressed in the grains lying before you. But whether the variety as such resembles Carmichael's to any extent only a practical proof may

demonstrate when grown side by side. Perhaps one or other of those present may feel inclined to try the experiment, for which I should feel very much obliged. Though Dr. Cobb avers that experiments are ventures which are in most cases failures, without them we cannot advance. It would be idle to suppose that men with their knowledge would take the wheat of the present day as a matter of fact, and as one which could not be improved upon. I call improvement any variation in the plant which tends to make it more valuable to mankind. Improvements may be of variable character, but I mainly refer to them as affecting quality of grain and straw, and that such improvements are possible and must necessarily be possible on account of the adaptability of the wheat plant, furnishes us with the guidance to bring about required results. As wheat has the tendency to make the best of surroundings and conditions, helped by a careful and methodical selection, it will develop propensities which make it differ from its parents in some respects. This capacity of wheat has long been taken advantage of, with the result that we possess to-day innumerable numbers. Most of the older pedigree wheats have been raised by selection in England, where Major Hallett succeeded with quite astonishing results within a very short time. Mr. Farrar's opinion may be quoted on this subject, as it tallies fairly exactly with practical experience. He says—"I am of opinion that wheats improved by selection alone are too short-lived and unstable in their improvements to be of real lasting value. I think their improvements continue to exist only so long as the same care is given to their retention as was given to their making. It means in practical farming that the good qualities speedily disappear if they are not propped up by special care." Of late years scientific and practical men have gone a step further to get the desired results. They have combined an elaborate system of pollinising, that is crossing, with an elaborate system of selection. By such means it has been possible to create entirely new varieties of distinct types which possess all the required qualities to make them ideal wheats for the localities where they are to be cultivated. Various States of the North American Federation have taken this most important matter in hand by investigating, through their respective agricultural universities, the qualities and possibilities of their cereal crops. Having gained the necessary information, an elaborate system of cross-breeding, combined with selection, was employed to turn the experience gained into profit. And that such profit has been gained is shown by the report of the University of Minnesota, which says that the average wheat yield of the State by the introduction of new and more prolific sorts has gained 1½ bush. per acre. The oats and barley yield, by the way, has been increased in a similar manner, and these results have been achieved within ten years of the commencement of the experimental work. Now, just imagine what it means to gain 1½ bush. per acre above the previous average! Would it not be a wondrous gift for Australia if such things could be accomplished here? And I really cannot see any reason why we should not be able to try to follow in the path in which other countries have succeeded. We possess in our fair land of Australia the necessary conditions to grow a raw material which will produce as valuable a flour as any yet made from wheat grown anywhere. It may sound high this assertion, but it is a fact nevertheless. The nitrogenous soil and the warm sunny climate, which are essential for the maturing of a high-class wheat are indigenous to Australia, and I think it is only a question of time when full advantage will be taken of Australia's natural conditions, and wheats produced whose quality and yield will be an improvement on most of our older varieties. In nearly every State of Australia men of large experience and experts in their noble work have taken up the question with the true spirit of the enthusiast. We may wish those more success in their work, for every individual in the State will reap a benefit if farmers should succeed in adding 1½ bush. per acre of superior wheat to their annual output. Advance we must! Advancement lies imbedded in the nature of the wheat plant, and it is but a reflection of the main staple produce of our fair country when we say—Advance Australia.

Narridy, August 31.

Present—Messrs. J. Darley (chair), R. Satchell, D. Creedon, J. Liddle, J. Smart, B. Flavel, F. Easter, G. Hiskey, and T. Dunsford (Hon. Sec.).

CROPS.—Several members said their theories that their seed had become malted was groundless, as the recent rains had brought the plants up thickly enough.

BLUESTONE PICKLE.—A member desired to know whether bluestone loses its virtue as a pickle for seed if it is dissolved three days before use, and whether hot or cold water differs in effect on the solution. [If the solution is kept in a wooden vessel its properties will remain unaltered, except that evaporation of water will make the solution stronger. Hot water dissolves the blue-

stone more quickly than cold water. The surface water dissolves more quickly than that at the bottom, because the dissolved bluestone sinks and makes the lower stratum of water more dense.—GEN. SEC.]

OFFICERS.—Retiring office-bearers were thanked. Messrs. James Darley, R. Satchell, and Thos. Dunsford were elected Chairman, Vice-chairman, and Hon. Secretary respectively.

Booleroo Centre, August 30.

Present—Messrs. W. Michael (chair), W. H. Nottle, J. Clack, G. Sargent, J. Repper, S. T. Parsons, J. Arthur, F. McMartin (Hon. Sec.), and four visitors.

FARMING INDUSTRY.—Mr. W. Michael read a paper on "The Outlook of the Farming Industry," to the following effect:—

There is no subject of greater importance to any country than the question of the future of its agricultural interest. A country that is rich in mineral deposits may give employment to a large number of hands and may enjoy prosperity for a while, but there is a limit to its resources and a limit to the prosperity which it is capable of producing, as a country may be rich in manufacturing industries, and a large population may be kept employed, and considerable prosperity may be enjoyed therefrom, but when such industries are depending for a market outside the borders of their own land there is a danger of them losing that trade at any time, either through the market being closed or through being undersold by others. But the country that is rich in agricultural lands possesses the means by which a population may be kept in permanent prosperity. Yet the outlook of that industry is not the most cheerful. In the first place, one cannot help being struck with the very strong feeling of dislike to farm life and farm work displayed by young people of the day; one of their marked tendencies is a strong desire to get into cities and towns. We find this even in those agricultural countries and districts where the people enjoy the greatest advantages, and where farming is carried on under the most advanced scientific methods, such as America and Australia. In the United States of America and Canada great difficulty is experienced by employers of labor in getting men to do the work of the farm, and in South Australia we find the tendency is very strong to get away from the farm. The last census clearly showed that the population of the city and towns was increasing much more rapidly than the country. It behoves us to inquire the cause, so that we might seek to check it. Of course we can understand the very trying seasons experienced by the farmers in the North, which have compelled many to leave their farms and seek a living elsewhere; but in more prosperous districts there is a strong desire shown to get away from the farm. I know of no more honorable or healthier employment than to be a cultivator of the soil. We are sometimes told that the long hours which farm hands have to work account for many leaving the farm; but if you take the hours actually worked (leaving out the tending of the horses), with the exception of about three months in harvest time, I doubt very much whether the average time worked would exceed eight hours a day. Again, we are told that the pay of farm laborers is not equal to the wages received in other callings. I am quite prepared to grant that that is so, but at the same time the expenses are not nearly so great, and I question if the average wage-earner in other employments is much better off at the end of twelve months than the average farm laborer. Again, we are frequently told that farm life is a very dull one. And it seems to me that this, more than anything else, accounts for so many of our young people seeking employment elsewhere. I think, with an enlightened system of education such as we have, the brain becomes more active and restless during leisure hours. In the cities there is more to interest and occupy the thoughts, there is more life, more to see, and more to amuse, and the city life is preferred to the country. With the aid of the machinery used by farmers for the cultivation of their lands and gathering of the crop I do not think the farm life can, in any sense of the word, be called hard. Then the prices of farm products are down to a very low ebb, especially with wheat. Not only is the return from the farm small, but there seems to be little prospect of any improvement for some time to come; on the contrary, there is danger of lower prices being experienced through a more extensive use of improved machines in some of the wheat-producing countries which at present are not using them. One thing that strikes one forcibly about agricultural life is the very high prices which have to be paid for the machines required compared with the low prices of the products of those machines. When you have to give the value of over 100 hundred bags of wheat for a binder, or the value of eighty bags of wheat for a windmill, or of fifty or sixty bags of wheat for a plough, one naturally thinks the amount of labor represented by value of wheat out of proportion to the amount of labor represented by the machine which he gets in return for the wheat.

Farmers in Australia are so far from the consuming markets that it takes nearly 1s. a bushel to get the product there. This heavy cost accounts for the very low price realised. Then we are a greater distance from the place where the imported agricultural machines are manufactured, and consequently they are very costly. The way in which various classes or divisions of men combine to secure themselves at the expense of others makes it necessary that the farmers should also combine in order to defend their own interest. For instance, the employes of a manufacturer engaged in manufacturing farm implements combine for higher wages or shorter hours. The employer concedes to their wish, but he immediately raises the price of his machine so that it will leave him the same margin of profit; or the importers or merchants importing various kinds of farm implements can combine together and fix the price at which they will sell their imported machine so as to leave them a profit—that means good interest on their money—but which will perhaps leave the person who uses the machine little in return for his labor; or the various banks may combine and fix the price or interest at which they will lend out money—and they will fix it at a figure that will cover all necessary expenses and leave a decent profit. Storekeepers, blacksmiths, and saddlers all fix the price at which they sell the products of their labors so as to cover all costs and leave a margin of profit; but when we come to the farmer, while he goes to the various persons from whom he wishes to purchase and asks them what they want for the various articles, he goes to the persons who buy the products of his labors and asks them what will they give him. He has no voice in fixing the price of either what he buys or what he sells. And it seems to me one thing for the future is there should be a combination of some sort among the farmers by which they should defend themselves and guard their own interests. It seems that the way in which farming is to become profitable in the future will be by having large farms with considerable capital. John Stuart Mills has said the experience of farming in various parts of Europe goes far to refute the popular idea that in order to farm successfully large farms with much capital are required. He says that the experience of Europe goes to prove that farming can be carried on profitably on small holdings. But I think farming as it is carried on with us is very different to farming in Europe in the past, for in the cultivation of the soil and gathering of the crop with us much machinery is required, and in order to enable the producer to get the fullest advantage of the capital invested in those machines it becomes necessary that he should get as much as possible out of them, and I think a large farmer is able to get more out of his capital invested in his machines than a small one. Then, again, a farmer with a large holding is able to spell his land and only crop once in two or three years, and so he is able to combine grazing with farming. I think the tendency with us is to kill out the small farmer and for our land to get into large farms. I do not say that I think this will be to the interest of the greatest number of people as to the interest of our country at large.

Port Broughton, August 26.

Present—Messrs. W. R. Whittaker (chair), J. Harford, A. H. Dolling, S. M. Bawden, E. Dennis, W. Tonkin, and J. Barclay (Hon. Sec.).

ANNUAL REPORT.—Chairman reported nine meetings having been holden during the year, with an unsatisfactory average attendance of seven members. This was the eleventh annual meeting, and during that period some valuable papers had been read, and much practical knowledge gained and imparted.

OFFICERS.—Retiring officers were thanked. Messrs. W. R. Whittaker and Jas. Barclay were elected Chairman and Hon. Secretary respectively.

PRESERVATIVE FOR WOODWORK.—Mr. Dolling said that in Borgund, Norway, there is a church over 900 years old, the preservation of which is attributed to a dressing with dissolved resin. He recommended boiling from 2lbs. to 3lbs. pulverised resin in 7 pints to 8 pints of linseed oil until all is dissolved, as a dressing for all woodwork of reapers, strippers, wagons, and other farm implements, machinery, &c.

SALINE SOILS.—Questions were asked as to what can be done with land where the salt water rises and destroys vegetation? [Dig a deep trench across the line from whence the salt springs arise, to drain and carry the water off. Throw the land up in ridges, and grow mangolds or other beets for stock. *Atriplex semibaccata* and other varieties of saltbush could be profitably grown

on such land, and could be cut for feeding stock. Olives will grow well on moderately saline soil, and in some similar places lucern will thrive.—GEN. SEC.]

CONTROLLING NATURE'S FORCES.—Mr. H. Dolling read extract from a Chicago paper ridiculing the idea that man, by use of explosives or any other power, can control hailstorms or cause rain to fall.

Redhill, August 30.

Present—Messrs. R. T. Nicholls (chair), S. H. Treloar, D. Lithgow, H. Darwin, A. A. Robertson, and J. N. Lithgow (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary reported ten meetings holden during the past year, with an average attendance of 8·6 members and five visitors.

OFFICERS.—Retiring officers were thanked. Messrs. D. Lithgow and R. H. Siviour were elected Chairman and Vice-chairman respectively, and Mr. J. N. Lithgow was re-elected Hon. Secretary.

SHEARING AND THE PREPARATION OF WOOL.—The following paper was read:—

In view of the advent of the shearing season an article may with advantage be devoted to the consideration of sundry matters connected with the removal and treatment of the fleeces. Anyone who has had any experience must be aware of the wounds inflicted by in-expert or careless shearers. As men engaged in denuding the sheep of their fleeces are paid by the 100, it is, of course, natural that they should desire to turn off as many as possible during the day; and it is this rushing style of doing the work which is responsible for so many patches being taken out of the living pelts of the sheep. Whilst the best and most careful shearers are apt at times to make a mistake in this respect, there is a large amount of carelessness, by which an unnecessary amount of suffering is inflicted on the animals, and the person in charge of the shed should do his best to prevent this evil. To treat the cuts and wounds inflicted tar is used on account of its healing properties, and also to keep flies and other irritating insects away; but the effects of tar being used in any way on wool are so serious that it should be tabooed altogether. Although good enough in its way as a cooling and healing unguent, the damage that tar does when the wool comes to be manufactured is such that, were every woolgrower aware of its harmful extent, it would never be used at all. Until comparatively recent years tar was almost universally used for marking sheep, so that, what with tar for cuts and tar for branding, a very considerable quantity of this undesirable substance was distributed over the area of the fleece. That all the remonstrances and press writing on the subject have not been in vain is demonstrated by the frequency with which the words "no tar" are seen imprinted on the bales of wool; and notifications to the same effect appear in the catalogue, showing that some owners at least have found that it pays to attend to the wishes of the buyers in this respect. Many operators in this market say they willingly give $\frac{1}{4}$ d. per pound more for wool on which tar has not been used, whilst others will not buy tar-stained wool at all if they know it. A farthing a pound may, on an average, be reckoned at 8s. 6d. a bale. Mention may here be made of the desirability of taking off the belly wool separately, and keeping and packing it apart from the other portions of the fleece. Many shearers take off the belly wool first, but whenever or however it is done, this wool should be kept separate. Although greasy belly wool brought up to 13d. per pound the year before last, the average top price for the previous eight years has been 6 $\frac{1}{2}$ d., so that it will be seen that belly wool, when properly treated, brings a very respectable price; whilst when rolled up and sold with the fleece, not only does it not sell so well as it would if separate, but its presence prevents the fleece wool realising as well as it otherwise would. Second cuts.—A careless shearers, when he has let his shears keep away too far from the skin, will make a fugitive blow at the ridge he has left, and bring off a sliver of wool length and staple; and such pieces on being shaken out at the rolling table fall in with the locks, only bringing lock instead of fleece price, which it would have done if taken off with the first cut. It would be far better for such wool to be left on, as it would go to next year's staple, whereas when made a second cut of it simply becomes fribby locks, and sells accordingly low. The extent of skirting which should be done depends so much on the state of the wool, the presence of little or much burr or seed, etc., that it is difficult to lay down hard and fast rules which could be of general application; and the extent to which skirting should be done must be, or ought to be, determined by the classer, owner, or person in charge of the shed. Speaking generally, the fleece should be

as lightly trimmed as possible, compatible with the removal of all objectionable, inferior, stained, or burry portions. There is no other operation in connection with preparation of wool for market which requires to be more judiciously done than skirting. Wool is often left on that ought to come off and *vice versa*. As to the general advisability of skirting as against not skirting at all there can be no question. There are buyers for every portion of the fleece, but none of them want all the portions rolled up together, except at a price at which they can afford to pay for the wool being sorted, and make a profit for their trouble as well.

Members having realised the injurious effect of tar on wool had been using kerosine for wounds, and several different specifics for branding—tattoo oil being considered the most successful. Members objected to second cuts, but did not think that the second cuts mentioned in the paper were so great a loss as those left hanging on the fleece; and as to the ridges mentioned, they thought they were just as well taken off as left on.

Nantawarra, August 28.

Present—Messrs. Jas. Nicholls (chair), J. W. Dall, E. J. Pridham, T. Dixon, E. J. Herbert, A. F. Herbert, H. J. Spencer (Hon. Sec.), and six visitors.

DISEASE IN STOCK.—Mr. A. Herbert said the Deputy Inspector of Stock had diagnosed the complaint amongst his horses as “rickets,” or “cripples,” which appears to prevail in localities where the causes of dyspepsia are present. It is generally thought there is a deficiency of phosphatic and ammoniacal principles in the soil and feed in such localities. Mr. Needham continued “The *post mortem* appearances are peculiar. Muscles pale and flabby, blood thin and watery, worms often present in stomach and intestines in large numbers, bones enlarged and softened, pressure causing them to crumble, and a deposit of calcareous matter obliterating the cavity of the joints. *Treatment.*—Where possible the animals should be removed from the country where they have contracted the disease, and put on hard river or well water. Nutritious food at regular intervals is most necessary, and those foods rich in phosphates are of course the best, linseed oil in doses of two to three ounces may be mixed with the food, or linseed swollen by water may be used. The following tonic is of use:—Solution of perchloride of iron, $\frac{1}{2}$ dram; infusion of quassia, $\frac{1}{2}$ pint; essence of ginger, $\frac{1}{2}$ oz. It is generally found that the land upon which this disease arises is either overstocked, barren, or in want of manure.”

SHEEP ON FARMS.—Mr. Jas. Nicholls read the following:—

At the present time this subject is occupying a great deal of attention, many things rendering it of considerable importance. The severe drought which has prevailed for so many years over nearly the whole of the pastoral lands in the different States has on many of the very large holdings diminished the number of stock by 75 per cent.; indeed, in many cases this percentage of loss has been exceeded. This, no doubt, has been the principal cause of the recent rise in the price of stock of all kinds, thus causing more attention to be paid to their keep on the smaller areas, where the rainfall is more reliable. Another reason is the fact that during the last few years the average price of wheat has been very low. This, combined with the fact that very frequently the return per acre has been very light, has necessitated the farmer taking advantage of any means by which the returns from his land may be profitably increased. In this State wheat has been, and no doubt will continue to be, the principal product of the Lower North; yet, under the new conditions of farming (I refer to the use of artificial fertilisers), the area under wheat may be very considerably reduced without diminishing the quantity of wheat produced. This would not only leave more of our land available for grazing, but the use of artificial fertilisers on the wheat crop very much improves the stock-carrying capabilities of land. The question then arises how to most profitably utilise the increased amount of fodder available; and whilst not advocating the keeping of sheep to the exclusion of all other stock (working stock are, of course, a necessity), I think that in this district they are the most profitable; for, in addition to the ordinary fodder plants and grasses, sheep consume many weeds which are left by the other animals; and in estimating the returns from,

or considering the advantages derived from, the keeping of sheep, we must consider the saving of labor effected by them in cleaning the land from weeds, more especially land in fallow or about to be fallowed. The opinion is held by many that the lighter scrub lands in this district give a better yield of wheat and are more free from takeall if simply ploughed and harrowed down fine at fallowing time—the earlier the better—and left in this condition till the following seedtime. In a case like this no stock will so effectually prevent the weeds from seeding as sheep; the farmer is thus enabled not only to keep down the weeds without the considerable amount of labor which would otherwise be necessary, but they also do away with the necessity to work the land at a time when it might be injurious to do so. On the better class of land it frequently happens that after it has been well worked with the cultivating implements showery weather about haytime will cause a large number of weed seeds to germinate and grow at a time when, owing to the press of other work, the necessary time cannot be spared to destroy them. Here, again, sheep render good service. The cost of cultivating a fair-sized paddock in a busy time would be considerable, and may fairly be credited to the indirect returns from keeping sheep. As to the best type of sheep for farms opinions differ; some favor the Lincoln, some the Lincoln, Shropshire, or Southdown ram crossed with the Merino ewe. Which will give the best return per acre is what we want to decide; and the question is, perhaps, a debatable one, each having satisfactory reasons for preferring a certain type. I favor the pure Merino. My reason for so doing is the fact that they are the most hardy; their wool realises a higher price than that of any sheep; they are more easily kept within bounds, and as on a farm the amount of fencing is proportionately greater than on a run, this is an important thing in their favor, as on the farm with a green crop on one side of the fence and bare fallow or indifferent feed on the other, the temptation to break bounds is much greater than on the run. Again, there is always a sale for the pure Merinos; the others, unless in good condition, are sometimes difficult of sale. Opinions also differ as to whether buying store wethers and fattening same for sale, or keeping ewes for wool and lambs, is the most profitable. In this district the keeping of ewes and lambs is, I think, the most profitable; and the successful result of the export of frozen meat, and the increase in the price of lambs resulting therefrom, will make it even more so in the future. Another reason for favoring keeping ewes for wool and lambs is that, when ewes and lambs are kept, in an ordinary season we have the largest number of stock when the flush of feed is on, and are therefore best able to keep them; and as the lambs grow and fatten we are able to dispose of them, thus diminishing the number of stock as the feed goes off, leaving the smaller number of stock to be kept when feed and water are scarce. If the practice of buying store wethers for fattening is followed it is, of course, also possible to have the largest number of stock when the feed is at its best, but it frequently happens at such times the difference in the price of fat and store wethers is not large enough to leave a margin of profit. Though there may be differences of opinion as to the best type of sheep for farms, there can be no questioning the fact that whatever type is kept they should be of good quality or class. At the present time there appears to be a desire on the part of farmers generally to improve the quality of their stock, and no class of stock will better repay care and attention in this respect than sheep. At the present time a high price has to be paid for such ewes as are to be recommended for the foundation of a flock; still, it is better policy to pay the higher price for such sheep than to purchase at a lower price an animal that will neither produce wool in quantity nor of good quality, and whose lamb cannot be expected to be nearly as valuable as that of the former animal. Still, if, owing to circumstances, a farmer is unable to obtain ewes of as good quality as he would wish, it is possible, by culling out the worst of his ewes each year (the number of the flock to be kept up by selecting the very best of the ewe lambs), and by using good rams with the remainder of the ewes, to very much improve the flock. When we consider that the ram is half the flock, it will at once be seen how important it is that those used should be of an undoubtedly good breed, and of a strain that has been carefully bred for a number of years, so that their good qualities have become fixed. In such cases only is it certain that they will transmit their desirable characteristics to their offspring. Unless care is taken sheep will degenerate, and will certainly do so if inferior rams are used. As to the number of rams to be put with the ewes, a ram will serve, perhaps, 100 ewes, but if given about fifty or sixty each it will be found that the lambs are more vigorous and the lambing more uniform. In the farmer's flock, where it is often desirable that a given number—say, a truckload—should be of even size and quality, the latter point is of some consideration, and will amply repay for the hire of the additional rams required. When sheep are kept in large paddocks, as on a run, it may not be necessary, or even desirable, to change them from paddock to paddock frequently; but on a farm, where the paddocks are much smaller, they do much better if frequently changed. Even if the feed is good in the paddock in which they are running, a change for a few days—say, once in a fortnight—is desirable. If a stack of good clean straw is provided in each paddock it will be found of considerable assistance in tiding over the times of scarcity with which, unfortunately, we are sometimes visited; indeed, those who have never tried it will be surprised at the quantity they will eat, even under ordinary circumstances. That they should have as much water as they require is, of course, a recognised fact. If they can have free access to it at all times

it is best. The question of shade is of more importance than we generally attach to it. I have noticed that when shade is available sheep will, in very hot weather, spend many hours of the day in it. To be standing all day in a shadeless paddock under a burning sun is very trying to the sheep and injurious to the wool. Shade from the sun is in this district of more importance than shelter in the winter; still, there are many times in the winter that sheep will make for shelter if it is available; and when we consider that any discomfort the animal suffers, whether from the extremes of heat or cold, results in a loss of condition, it will be admitted that it will pay to see to their comfort in this direction, even if we are uninfluenced by humane motives. A great deal of the scrub land in this district has been mullenised, and what I would suggest is that in those paddocks where the mallee shoots are not already dead a patch—say, two chains square—should be left in the centre of each paddock, which should, in the course of a few years, provide a nice shelter belt for them. Where sheep are kept good fences are absolutely necessary. Five ordinary wires with a barb wire on top make a good reliable fence. My own fences, which I find satisfactory, have the wires placed as follows:—The bottom wire 5in. from ground, next wire 10in., next 15½in., next 21½in., next 28in., next (barb) 38in., or 3ft. 2in. in height. On a sheep-proofed farm there is not much labor connected with the keeping of sheep, and it can be so arranged that the principal work that is necessary, such as shearing, &c., may be done at a time when it will not clash with important farming operations. The growing of rape, or some such quick-growing early feed, and the provision of a reserve stock of fodder, I am sure, will in near future receive more attention than it has done in the past. The seasons we cannot control, but we may do much to lessen the ill effects of the adverse ones, and make the keeping of sheep an even more important factor in the production of an income than it is at present.

In discussion, Mr. Nicholls said he would recommend one ram for fifty ewes, and they should run together for six weeks. The district would generally carry an average of two sheep to the acre. Perhaps more could be carried where superphosphate is being used. He kept a stack of good clean wheaten straw in each paddock where the sheep ran, and they ate a good deal of it, even when other feed was available. He gave his sheep "cocky chaff" and dry mustard (charlock), cut with hay but rejected by horses, and he found that sheep were fond of it when feed was rather scarce. A question raised but not settled was—"Will crossing Merino ewes with Shropshire or Dorset-Horn rams pay better than breeding pure Merinos?"

Quorn, August 29.

Present—Messrs. R. Thompson (chair), F. Herde, J. Cook, J. B. Rowe, C. Patten, G. Walker, J. Brewster, and A. F. Noll (Hon. Sec.).

CONSERVATION OF FODDER.—The Hon. Secretary read a paper to the following effect:—

In this part of the State, where long droughts often occur, conservation of fodder is an important matter. Every farmer, therefore, who is in a position to do so should reap as much as is possible of his best crops with the binder. The reaping should be done whilst the grain is in the dough stage; and this can be done from ten to twelve days earlier than when the grain is dead ripe and fit for the stripper. This will also save the grain from being shaken out through overripeness or from the action of storms. Stook the sheaves directly they are cut, if the weather is hot, making large stooks, and they will be quite safe until the ordinary harvest is finished. To take out the grain some sort of a thrasher will be required—a disc-header, for instance. The straw should be stacked, and will prove to be better fodder than bad hay. If it is chaffed with an equal quantity of good hay it will be all that is wanted for a farmer's working stock. The husks, or "cocky chaff," will be found to be superior to that turned out from the stripper. His horses fallowed 2.0 acres this year on that, with headed straw and about one-third good hay chaffed, and they are now in good condition. There is another advantage in that, all weeds and straw are gathered off the land, which is ready to be ploughed at any time rain may fall.

In answer to questions the Hon. Secretary said that grain taken in the dough state was quite equal in weight and value to that taken dead ripe by the stripper. As most farmers owned a string binder—which takes the place of the mower—there would be no extra expense in binding the crop. If a farmer possessed no binder, and had a good crop, he might hire a machine to gather it in.

Morgan, September 2.

Present—Messrs. R. Windebank (chair), G. Schell, G. Ruediger, E. Jacobs, R. Wohling, J. Bruhn, W. G. F. Plummer, and E. French (Hon. Sec.).

ATTRACTING RAIN.—Mr. Plummer referred to possibility of causing rain by the use of explosives. He believed it would be worth trying in this dry district, and thought it only required to be taken up properly to meet with success. Mr. Schell agreed; he believed there was every chance of success if experiments were carried out in a proper manner. During the construction of the line to Morgan a considerable amount of blasting was done, and it was noticed that it rained heavily every day. [This is not a new subject. For years many men have held the opinion that rain could be caused by the use of explosives, and at times considerable expenditure has been incurred in testing the matter, but up to the present nothing satisfactory has resulted. Scientists differ on the question of the possibility of inducing rainfall by these means.—GEN. SEC.]

HARROWING GROWING CROPS.—The Hon. Secretary initiated a discussion on the means of conserving the moisture in the soil. Mr. Jacobs reported result of harrowing a growing crop of wheat. He got 4bush. per acre more from the harrowed crop than from crop sown same time and not harrowed. He attributed the result to the fact that the land harrowed was loose on the surface, and consequently the moisture was retained better. He did not think there was any danger of injuring the crop if harrowed at the proper time. Mr. Ruediger agreed; he knew of an instance where harrowing a crop growing on stiff soil resulted in a much larger increase than that mentioned by Mr. Jacobs. Members were of opinion that in no case should the crop be harrowed while the soil is dry or powdery; the plant should also be strong enough to resist the harrows. The loss of a few plants would be more than compensated by the increase in development of those that remain.

SALTBUSH.—The Chairman wished to know whether there was any saltbush seed available for distribution. The Hon. Secretary had sown several lots of saltbush without success, possibly owing to the absence of moisture in the soil. He had noticed that saltbush grew best where the seed was buried close to the surface and allowed to take its own time in germinating. The only place he had seen young seedlings during the past six years was where the bush had been fed to stock; the seeds which had been knocked out and trodden into the surface soil germinated after lying in the ground for two years. [Any Branch can obtain seeds of saltbush on application. The seeds must be covered very lightly, and on salty soils they will do better if just under the surface. Probably the best way to secure a stand would be to harrow the ground until a good tilth is obtained, then sow seed on the surface and roll.—GEN. SEC.]

Pine Forest, August 20.

Present—Messrs. R. W. Bawden (chair), G. Inkster, J. Flowers, F. Masters, and R. Barr, jun. (Hon. Sec.).

THE LATE C. H. SMITH.—Members supported movement to perpetuate the memory of the late Mr. C. H. Smith, of Ardrossan, who did so much to perfect the stump-jump plough and other implements.

FIELD TRIAL SOCIETY.—Delegates reported hopefully of prospects of proposed field trial of harvesting implements at Paskeville early in December.

SHEEP ON FARMS.—Mr Bawden stated that when he tried to grow wheat on dirty land not fed down by sheep he had always failed, drake and wild cats invariably getting the upper hand. On one occasion he was showing Professor

Lowrie a field sown to wheat, but choked with rubbish. He explained how the land was fallowed, the implements used in working, and means adopted to destroy the weeds. The Professor's remarks were, "You have worked the guts out of the land; why don't you get sheep?" He convinced him of the necessity of keeping sheep in conjunction with wheat-growing. He at once set to work to make the paddocks sheep-proof and purchase a flock of sheep. He was fortunate in getting from the first clip of wool enough to pay for the sheep, as well as a good portion of the cost of making the fences sheep-proof. Cockspur, drake, and wild oats soon disappeared, and he was now able to grow clean crops with much less labor. He maintained that it paid handsomely to keep a few sheep on the farm. They were less trouble than other stock, save the butcher's bill—no inconsiderable item—and bring in good returns. In reply to question, Mr. Bawden said he would make his fences sheep-proof with wire-netting in the future. He preferred Lincoln or Shropshire rams mated with Merino ewes. Mr. Flowers estimated the cost of wire-netting fences at £17 per mile. It was unanimously resolved that "This Branch was of opinion that it is wise and profitable to keep sheep when the farm contains 600 acres or more, but it is impracticable on a holding of less extent."

ANNUAL MEETING.—It was decided to hold a picnic next January to celebrate the completion of the tenth year of existence of the Branch.

COST OF WHEAT-GROWING.—The Hon. Secretary called attention to Crystal Brook report in August issue of the *Journal of Agriculture* dealing with cost of wheatgrowing, and suggested members should discuss the matter at next meeting. Four members agreed to furnish estimates for discussion.

Bowhill, August 31.

Present—Messrs. J. T. Gregory (chair), N. P. Norman, J. G. Whitfield, A. Dohnt, E. P. Weyland, A. K. G. Dohnt, J. Waters, F. H. Baker, J. McGlashan, W. Towill, F. A. Groth (Hon. Sec.), and four visitors.

NEW PLOUGH.—Mr. W. Tyler, jun., showed a plough made by himself, and gave a trial of its capabilities on very rough ground. It was seven-furrowed, stump-jump, steel, on the "Boss" principle, fitted with J. D. Shearer's intermediate and passing plates. Members agreed that it did very good work.

IMPACTION.—Mr. W. Towill said there was an error in report of his paper on this subject. He used *nux vomica* and *aconite*, *not arnica*.

Forest Range, August 29.

Present—Messrs. J. Rowley (chair), G. Monks, J. Green, A. S. Gunning, W. McLaren, A. Green, J. Jennings, A. Brockoff, and H. H. Waters (Hon. Sec.).

HONORARY MEMBERS.—On the motion of Mr. Monks it was resolved that this Branch is of opinion that, in order to enlarge the scope of usefulness of the Agricultural Bureau it is advisable that for every five full members on a Branch there should be power to elect three honorary members. Mr. Monks said his reason for moving this was that he believed by increasing the membership in this way they could increase the usefulness of the Bureau without any extra expense. The honorary members should have the same right as full members to discuss and vote upon matters brought before the Branch, but would not be entitled to free copies of *Journal*, nor to privilege tickets in connection with Conferences, &c. There were hundreds of good men not connected with the Bureau, and who under the present system have practically no

chance of becoming members. Then there were many members who do nothing [and who should therefore be struck off the roll—GEN. SEC.], while some Branches were also in need of a stirring up. It stood to reason that the experience of twenty-four men would be of more value than only fifteen, and that information disseminated by the Bureau would therefore be of greater value. He admitted that visitors were welcomed at the Bureau meetings, and allowed, under certain conditions, to take part in the discussions, but for some reason they did not attend. [Would these gentlemen that do not attend as visitors attend as honorary members, and would there be a better attendance with twenty-four members than with fifteen? From many years' experience of committees and boards, I very much doubt it. With a larger board the members seem to have fewer scruples about absenting themselves from meetings. Even with the present membership there are too many "sleeping" partners in the Bureau; men who will take all they can get, but will give nothing in return. These men should be struck off the roll to make room for others.—GEN. SEC.].

Penola, August 10.

Present—Messrs. W. Miller (chair), D. McKay, J. D. Wilson, E. F. McBain, L. W. Peake, R. Fowler, E. A. Stoney, and Dr. F. Ockley (Hon. Sec.).

OFFICERS.—Office-bearers for past year were thanked, and Messrs. W. Miller, D. McBain and Dr. F. Ockley were elected Chairman, Vice-Chairman, and Hon. Secretary respectively.

STICKY SUPERPHOSPHATE.—Mr. T. H. Morris said he mixed 70lbs. Thomas phosphate to the ton of sticky super., and this caused it to run through the drills freely.

THE LATE MR. JOHN RIDDOCH.—This gentleman was one of the founders and first Chairman of this Branch, and after members had expressed their admiration of their late member's high character for integrity and his constant desire to advance the best interests of the district, they resolved to send a letter of condolence to the family of the deceased gentleman.

AGRICULTURAL CLASS.—In the event of the agricultural class at the public school at Naracoorte failing for want of support, it was resolved to endeavor to get a similar class established at Penola.

SPEYED COWS.—Mr. McKay directed attention to the advantages attached to speyed cows, and suggested that instruction in the practice would be advantageous.

GENERAL REMARKS ON MANURING.—Mr. E. F. McBain read the following paper:—

In order to understand the subject of manuring it is necessary to know something of the manner in which plants feed, or assimilate, and the nature of ordinary soil. If we take a sample of ordinary soil and analyse it, we will find the following constituents:—Lime, magnesium, iron, potash, phosphoric acid, nitrogen, manganese, chlorine, sulphur, and soda, with numerous others of less importance. Of these phosphoric acid, potash, and nitrogen are so essential to plant life that they may be said to determine the fertility of our soils, and, unfortunately, being present only in very small quantities, they are most apt to become deficient. Phosphoric acid is present in most soils in small quantity, as is also potash.

Plants take all their mineral matter from the soil, and the carbon or combustible part of the plant is taken from the air. But before any of this mineral matter can be assimilated by the plant, it must be in a state of solution, or dissolved in water; and as the water with which the mineral matter of the soil comes into contact is only very slightly acid, it will be readily understood that this mineral matter, to be soluble, must be in a very fine state of division. This refers particularly to the salts of lime, which constitute almost entirely the base of our mineral manures. All the essential constituents of plant food are present in the soil in very small proportions; and in many cases the greater part of this supply is in an insoluble form,

and in the ordinary course of events it takes nature a long time to change even a small trace of these non-available ingredients into a soluble and available form. So that in order to keep our soils fertile we have either to assist nature in her efforts to render available these insoluble ingredients, or we must supply them from some other source in the form of manure. We have seen that the essential elements which are most apt to become deficient in the soil are phosphoric acid, nitrogen, and potash. Of these it would appear that over the greater part of South Australia, at least, phosphoric acid is the only one that is deficient at present, it being only in isolated positions that either nitrogen or potash has any beneficial effect on our crops. Potash is present in fairly large quantities in clay soils, while nitrogen is always present in the decaying vegetable matter which gives the dark color to some soils, besides being in abundance in the free state in the atmosphere, from which it can be absorbed by the nitrifying bacteria present in the soil, and rendered available for plant food.

Phosphoric acid seems to be the one essential that is lacking, and this we are endeavoring to supply by the application of phosphatic manures, such as superphosphate, potash, &c. The value of all these phosphatic manures depends on the amount of phosphoric acid they contain, and the more soluble the form in which this occurs the better if we wish to get quick returns for our money, and the most soluble form of phosphatic manure is superphosphate. Superphosphate may be made from any kind of phosphatic manure by treating it with sulphuric acid. For this purpose are employed principally phosphatic rock, bones, and basic slag. Bone super. differs only from bonedust in the state of solubility of its phosphoric acid and not in the quantity of phosphoric acid present. If bones are ground to an impalpable powder they are nearly as soluble as superphosphate. [Basic slag is not used in the manufacture of super. If sulphuric acid is added to bonedust to make it into super. the percentage of phosphoric acid must be reduced correspondingly. The phosphoric acid in super. is much more readily soluble than in the finest of bonedust.—GEN. SEC.]

In manuring a wheat crop, for instance, preference is always given to super. over bonedust, because the latter usually takes five or six years to become completely available as plant food. If we were to put bonedust on we would require a much larger quantity than of superphosphate to get the same result, but it would only have to be renewed, say, every five years. This is why bonedust should be applied to permanent pasture in preference to super.

Much of the superphosphate now on the market is too soft and sticky to run through the drill freely, but this can be corrected by drying it with some substance which does not alter the chemical composition of the super., such as bonedust in very small quantities, or gypsum.

I believe gypsum would have a good effect on most of the soil in this district. As the knowledge of scientific manuring extends, the average yield of cereals per acre in South Australia will considerably increase, and the general effect will be to lower the selling value of some of the high priced agricultural land, and enhance the value of land which at present is considered almost useless for agricultural purposes. This, at least, is my opinion, based to some extent on actual experience. Given land which is deficient in phosphoric acid only, and which is situated in a district with a good rainfall, it can be made very fertile for comparatively only a slight expense.

The heavier the rainfall the greater the quantity of manure can be used per acre. On wheat and barley in this district I would apply up to 2cwts. per acre of super., and on grass land from 4cwts. to 5cwts. of bonedust per acre. Plants do not assimilate their mineral constituents solely through their roots, but can also absorb mineral nutriment directly applied to them. As in the case of vines being manured by applying soluble concentrated manure to the shoots where they are cut off sulphate of iron is applied to the freshly cut section of vine shoot to correct chlorosis, which is caused by an excess of calcium carbonate being absorbed by the vine, and which can be detected by the yellow unhealthy appearance of the vines.

Forster, August 29.

Present—Messrs. J. Retallack (chair), W. Johns, F. Johns, J. Johns, John Johns, F. Towill, W. Sears, S. Tears, J. D. Prosser, J. H. Prosser, and E. Schenscher (Hon Sec.).

FOREST RESERVES.—Members decided not to support Bakara Branch in an endeavor to secure natural forest reserves, on the ground that such reserves would become breeding grounds for rabbits. Members consider that each farmer should reserve timber for all his requirements on his own holding.

EXTERMINATING RABBITS.—Mr. John Johns read a paper on "The Best Way to Exterminate Rabbits." He considered phosphorised pollard the best poison. A dragged log is better than a plough-furrow in his locality, because the wind blows the sand and covers many of the baits in a furrow. He would use poison two or three times, and then dig out the burrows. This work is best done during February and March. When green grass begins to appear he would use ferrets, with nets, dogs, and gun. He would prefer ferreting to trapping or digging the rabbits out of their burrows.

Hartley, August 26.

Present—Messrs. A. Dalton (chair), H. Reimers, A. Thiele, W. Klenke, W. Kutzer, T. Jaensch, B. Wundersitz (Hon. Sec.), and one visitor.

COST OF GROWING WHEAT.—The majority of members consider the following a fair estimate of the cost of growing an acre of wheat:—Ploughing, 5s.; harrowing, 1s.; drilling, 2s. 6d.; manure, 4s.; seed, 2s. 6d.; rolling, 1s.; reaping and cleaning, 5s.; total, 26s.

CROPS, &c.—Crops in most cases are thin, only about half the seed having germinated, owing probably to the cold winter. Mineral supers. are considered no good on the Bremer Flats. [Would it be worth a trial? Perhaps the super. would prove as valuable there as it has on thousands of farms elsewhere.—GEN. SEC.] Members would like to know of something that would prevent birds devouring the seed directly it is sown. Tar has been effective, but it prevents the seed running through the drill. [In some parts of England farmers use red lead, a little of which goes a long way.—GEN. SEC.]

SALTING HAY.—Members agreed that it is desirable to salt hay when it is being stacked. It keeps out mice, and the horses do better on salted hay. It prevents the hay becoming mouldy, if it is damp. The better way is to dissolve the salt with water and sprinkle a little on each load when stacked.

Murray Bridge, August 30.

Present—Messrs. R. Edwards (chair), B. T. E. Jaensch, W. Schubert, W. Wundersitz, Hermann Schubert, W. Lehmann (Hon. Sec.), and one visitor.

CATTLE-FEEDING.—A paper by Mr. W. G. Hannaford was read, as follows:—

I think all stock require hand feeding more or less all the year around, no matter how much grass there may be, for when the grass is cold, wet, and sloppy a little dry hay chaff with crushed wheat or pollard stays the green feed, is a change, and with milking cows produces a better quality of milk. Then, when grass becomes dry, something in the way of copra cake, linseed, bran, or silage is needed to substitute green feed. Any or all of these can be given with hay chaff made damp—not fed dry as when the grass is green. I have fed both cows and horses in this way, and so far have not had any trouble with them. I milk from four to six cows all the year round, and keep them in the stall tied up at night, and bedded with dry straw the same as my horses. I will give about the return from one cow which, I think, would be a fair average of many with the same treatment. I bought a cow about eight months ago. She had been in milk about six weeks. Up to the present, I consider, she has given me about 320 galls. of milk. This I estimate, during the eight months, to be worth 6d. per gallon; that would be a return of £8. I am still milking her, and expect her in again in about six weeks. I would like members to experiment in fattening stock, if only two head. Take two about equal size, age, and condition, put one in stall at night and feed, let both run together in the same paddock. for, say, three to six months, and report the market value of both at the end of this time.

Mr. W. Schubert had tested feeding an old dry cow with pollard and cocky chaff, to fatten her, and was fairly successful. She consumed about six bags of pollard in two months, by which time she made prime beef. The cost was as follows :—Six bags pollard, £2 14s. ; attendance, 3s. 6d. per week, £1 8s. ; value of cow before feeding, £2 ; total, £6 2s. ; value of cow when fattened, £7 10s. ; profit, £1 8s.



INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

Number of Persons Registered and Found Employment by Government Departments and Private Employers from July 31 to August 30, 1901.

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youths	126	172	337
Masons and bricklayers	2	3	3
Stonecutters	—	—	3
Plasterers	2	—	2
Carpenters and joiners	9	3	10
Painters	3	—	1
Plumbers and ironworkers	1	—	2
Boilermakers and assistants	—	1	5
Blacksmiths and strikers	7	4	2
Iron and brass moulders	3	—	4
Fitters and turners	3	—	—
Enginedrivers and fireman	2	3	—
Tinsmiths	—	—	1
Well borer and driller	1	—	—
Miners	—	—	2
Compositors	4	—	9
Baker and cook	2	—	—
Gardener	1	—	—
Wattle strippers	—	—	2
Caretaker, &c.	—	—	2
Apprentices	16	1	1
Cleaners	10	13	—
Porters and junior porters	31	20	4
Rivet boys	3	—	—
Stonebreakers	—	—	12
Totals	226	220	402

August 30, 1901.

A. RICHARDSON, Bureau Clerk.

The Factories Acts.

CONTRIBUTED BY CHIEF INSPECTOR BANNIGAN.

(Continued from page 95.)

In order to facilitate the working of this Act, and also in order to determine the lowest price or rate which may be paid to any persons or classes of persons for wholly or partly preparing or manufacturing, either inside or outside a factory, any particular articles connected with, or to any persons or classes of persons employed in, the manufacture of clothing, including white work, boots and shoes, furniture, or bread, and such other manufacture, process, trade, or

business as may be from time to time fixed or determined by the resolution of Parliament, the Governor may, by proclamation in the *Government Gazette*, direct the election of Boards consisting of not less than four or more than ten members and a chairman.

Of such members one-half shall be elected by and consist of registered employers, and one-half by and consist of registered employes. Lists of voters shall be prepared, and the election and method of registration of voters shall be conducted in manner to be prescribed by regulations, which shall specify the time within which the election is to take place. Should no election take place within the time specified, the Governor may, by proclamation in the *Government Gazette*, appoint such Board or Boards or member or members of any Board as may be thought proper. A Judge of the Supreme Court or a Special Magistrate shall act as Chairman of the Board, and shall be appointed by the Governor.

Members of Boards shall hold office for twelve months only.

All powers of any Board may be exercised by a majority of the members thereof. In the event of equality of voting, the Chairman shall have a casting vote.

To aid the Board in facilitating the working of the Act, each Board may, as regards the particular process, trade, or business in respect to which it shall have been appointed, issue any written directions to any inspector not inconsistent with the Act, which directions shall be obeyed by the inspector.

In fixing the prices or rates the Board shall take into consideration the nature, kind, and class of the work, and the mode and manner in which the work is to be done, and the age and sex of the workers, and any matter which may from time to time be prescribed, or which the Board considers may affect such prices or rates. So far as regards any articles, process, trade, or business in respect to which any Board is appointed, every such Board shall determine and specify the lowest price or rate of payment payable to any person or classes of persons employed in such process, trade, or business, or for wholly or partly preparing or manufacturing such articles.

A copy of such determination shall be given to every person who at any time after such determination is in force prepares or manufactures any such articles outside a factory by the person who directly or indirectly issues or gives out, or authorises or permits to be issued or given out, any material for the purpose of being prepared or manufactured outside a factory or workroom.

Such price or rate of payment shall, in the case of work to be done outside a factory, be fixed at a piecework price or rate only for wholly or partly preparing or manufacturing articles of clothing, or wearing apparel, or boots or shoes; but for every other kind of work it may be fixed at a piecework price or rate, or a wages price or rate, or both, as the Board thinks fit. The Board shall fix a wages rate for any work such as is done by persons operating at a machine used in any factory.

Every determination of any Board shall be and remain in force from some date to be fixed by such Board (not being within fourteen days from the making of such determination) until altered or revoked by the determination of any Board.

When determining any price or rate of payment every Board shall also determine the number or proportionate number of apprentices and improvers who may be employed within any factory, and the lowest price or rate of pay payable to such apprentices or improvers when wholly or partly preparing or manufacturing any articles as to which any Board has made a determination, or when engaged in any process, trade, or business respecting which any Board has made a determination.

The Board may permit the employment at special rates of any persons who, by reason of age or physical infirmity, are unable to find employment at the general prices or rates fixed by the Board.

Where a price or rate of payment for or the hours of labor of any persons or classes of persons employed in any process, trade, or business, or for wholly or partly preparing or manufacturing any articles as aforesaid, has been determined or limited by the Board, and is in force, then any person who either directly or indirectly, or under any pretence or device, attempts to employ or employs, or authorises or permits to be employed, any person, apprentice, or improver in any process, trade, or business, or (other than the persons coming within the operation of the last preceding section) in so preparing or manufacturing any such articles at a lower price or rate of wages or piecework (as the case may be) than the price or rate so determined, or who employs, or attempts or permits or authorises to be employed, any person for longer or different hours of labor than the hours determined or limited by the Board, or who attempts to employ, or employs or authorises or permits to be employed, any apprentice or improver in excess of the number or proportionate number determined by the Board, or who is guilty of a breach of any of the provisions of this part of the Act, shall, on conviction, pay a penalty for the first offence of not more than £10, and for the second offence of not less than £5 nor more than £25, and for a third or any subsequent offence of not less than £50 nor more than £100; and the registration of the factory or workroom of any person who is convicted under this section of a third offence shall, without further or other authority than this Act, be forthwith cancelled by the Chief Inspector, provided that such cancellation may be annulled by the Board: Provided that in the event of any excess number of apprentices or improvers being unavoidable from causes such as slackness of trade or illness, then three months shall be allowed to adjust the proportion. And in like manner any determination of any Board limiting number of apprentices or improvers when first applied shall not come into force for six months from date of publication. This section shall not apply to any extra hours of work occasioned by urgent necessity or by breakdown of machinery if notice in writing of such urgent necessity or breakdown be sent to the Chief Inspector within forty-eight hours, such overtime to cease if so ordered by the Chief Inspector or by the Board.

The determination of any Board as regards prices or rates shall be signed by the Chairman thereof, and published in the *Government Gazette*, and shall apply to all places to which the determination may be expressly applied by the Governor by a notification published in the *Government Gazette*.

The production before any Court, Judge, or Justices of a copy of the *Government Gazette* containing the determination of any Board shall be *prima facie* evidence of the due making and existence of such determination and of the due appointment of such Board and all preliminary steps necessary to the making of such determination.

When the Board enumerates several operations in the description of the work in any determination, and when any one or more of such operations is omitted by the direction or with the expressed or implied consent of the occupier of the factory or his manager, foreman, or agent, such omission shall not affect the price or rate to be paid in connection with the particular work; but such price or rate shall, unless otherwise provided in such determination, be that fixed as the price or rate for the whole work described.

When in any determination any Board has fixed a wages rate only, then it shall not be lawful for any person to pay, or authorise, or permit to be paid therefor any piecework rates, and the receipt and acceptance of any piecework rate shall not be deemed to be payment or part payment of any such wages.

The Richest Nation in the World.

The richest nation in the world proportionally, says *Science Siftings*, is not Great Britain, not busy little Holland, not even the United States. For the greatest average individual wealth we must look to the Australian Commonwealth. Australia is rich in land fit for settlement and industry. Its national prosperity is dependent upon no single product, but embraces pastoral, agricultural, and mining industries in almost equal degree, and to these are rapidly being added manufactures. Last year the total value of the products of the colonies forming the Australian Commonwealth amounted to fully £110,000,000.

The mineral resources of Australia cannot even be guessed at. In the last forty-eight years the country has produced gold to the value of £360,000,000; in the last twenty silver to the value of £30,000,000. Diamonds are found in one district, rubies in another. There is at least one emerald mine in New South Wales, and opals equal to any in the world are found in Queensland, while the pearl fisheries of the North-West Coast produce a considerable portion of the most valuable pearls of commerce.



Journal of Agriculture

AND

Industry.

No. 3. REGISTERED AS]

OCTOBER, 1901.

[A NEWSPAPER.

VOL. V.

NOTES AND COMMENTS.

Hot dry weather during the early part of September caused considerable anxiety to farmers, particularly in the Far Northern Areas. About the middle of the month, however, there were splendid soaking rains through the agricultural areas, which have greatly improved the prospects of the coming harvest. Many crops have, however, run up to head too soon, while the hay crop, on the whole, will not be heavy. In the southern districts both feed and crops are decidedly backward, and, though the weather during the past fortnight has been favorable to their development, they will both be much below last year's returns. The showery weather has been distinctly favorable to the development of fungoid diseases of fruit trees, and it is nearly certain that those growers who have neglected to spray their trees with Bordeaux mixture will have cause to regret their neglect, as apricot shothole, peach curl-leaf, and apple and pear scab promise to be fairly prevalent.

Professor Lowrie's address at the recent Bureau Congress, published in this issue, is well worthy of careful reading by all interested in agriculture. The progress made in agricultural operations in this State are dealt with and the possibilities for the future enlarged upon. It will be seen that the Professor is favorably impressed with the opportunities of our farmers; in fact, he pictures a very prosperous future for the farmer who will work and utilise his land to the best advantage. As the Professor has a thorough knowledge of South Australian conditions and possibilities, his remarks are exceedingly cheering, and will be read with pleasure by those who were not fortunate enough to hear him speak. He has now left this State for New Zealand, and carries with him the good wishes of nearly all those with whom he has come in contact during his work here.

At the Annual Congress of the Bureau, held last month, a paper by a South-Eastern factory manager on "Butter Factories and Private Separators" was read, but unfortunately the Hon. A. W. Sandford, M.L.C., diverted the discussion to a point that does not admit of discussion, viz., the value of the hand separator. Most of the speakers insisted upon the necessity for hand separators on many farms, particularly in the northern districts, but missed the main point, which was that the use of the hand separators by dairymen in close

proximity to a factory was injurious to the butter industry. Several factories are suffering severely owing to the use of these separators by close-adjacent owners of cows, the result being that the factory machinery does not work to its full power. This question is undoubtedly a serious one to shareholders, and seems likely also to materially affect our dairying industry. There is no question that under the best of conditions high-quality butter can be manufactured from cream separated on the farm, but the difficulty lies in the fact that to a very large extent these conditions do not exist, and consequently the cream suffers.

Many farmers hold erroneous ideas as to the value of soil analyses. We hear farmers speaking as though they only required to have the soil analysed to know what manures to apply to certain crops to obtain the best returns. This, however, is far from being so. In the first case, as every farmer knows, it would be nearly impossible to obtain a sample that would fairly represent even a ten-acre field. Besides this an analysis will only show what the soil contains; it will not tell the farmer whether the plant food is in such a condition that the plants can make use of it, neither will it tell him what treatment the soil requires to make that plant food available. So many other things, such as the physical condition of the soil and subsoil, its ability to retain moisture or perhaps the reverse, that (except to the scientist) a soil analysis is just as likely as not to prove misleading in dealing with the manures such a soil requires. The only guide to the farmer is experience. Find out what others have done under similar conditions, and prove by experiment whether the treatment beneficial in their case is equally so in yours.

That little country, Denmark, affords producers throughout the world many object lessons in regard to the development of rural industries. Their success in the dairy industry, through systematic oversight and co-operative efforts, is well known, but their successes in the export of pork and eggs is not so generally known. By studying the requirements of the British market, and then working to meet those requirements, they have developed an export trade in pork, fresh and cured, but chiefly bacon, that now returns over £3,000,000 annually to their country. Twenty years previously their export was less than 5 per cent. of this amount. With eggs their success has been equally as great. From about 6,000,000 in 1895 the export in four years of eggs to London had increased eightfold, reaching in 1899 over 48,000,000. This has been largely due to the Co-operative Society, formed for dealing with the export of eggs, the members of which number about 22,000.

The greatest trouble we have to fear and to guard against in regard to improvement of our dairy herds is that of the "grade" bull. There are so many men who will want to save the bull calves that result from a cross between a pure bull of a dairy family with a cow of no particular breed, or one that is a cross between two distinct breeds. There are a hundred chances to one that the progeny of a cross-bred bull or of a "grade" bull will be really good. The only rational way to improve the dairy herd is to use the best milking cows and put them to a pure-bred bull of a milking family in every case. The heifers from this union will almost certainly be good milkers, and if these again are put to a pure bull the improvement will be progressive, until, after five or six generations, the bull calves may be worth keeping for stud purposes.

One very useful work that could be undertaken by Branches of the Agricultural Bureau would be to organise stud clubs in their several districts. Say a really good stallion is wanted, or a pure dairy bull, or any other pure animal for breeding purposes, the organising Branch should secure a sufficient number of patrons pledged in writing to support any one owner who will introduce the desired animal. The stud animal to be examined by a competent veterinary surgeon, and approved by a committee; or the organising body could either purchase or lease a stud animal if guaranteed by a sufficient number of farmers who would avail themselves of its services.

Some men, when they begin to imagine that a reform can be effected upon existing customs or practices, appear to shut their eyes to the facts governing the case, and try to force their theories down the throats of the public without regard to the ultimate consequences. Now, even though there were but one port of shipment on the whole coast of South Australia, it would be more than doubtful whether bulk shipments of wheat under the elevator system could be made to pay as well as shipment in bags; but with our numerous ports, and the comparatively small shipments that would take place at each, it is a certainty that the costly elevators would entail a heavy loss to the farmers and to the community generally.

Deep sowing and deep planting have many advocates, and sometimes they point triumphantly to the fact that the young plant has developed two distinct sets of roots—one set deeply down, proceeding from the seed, and another set produced from a thin stem which had managed to reach the surface, the latter being close to the surface. If the lowest set of roots were carefully examined it would be found that they were weak and useless, and the stem between them and the upper set of roots had simply served to save the life of the plant until its leaves could get into the light and air. Undoubtedly until the second lot of roots has been developed the plant has been struggling for bare existence, and its progress has been seriously checked.

Some observations made in France have led to the conclusion that it is highly probable that onions grown on beds that have been manured with sulphate of potash will keep sound and good for a much longer period than others of the same variety grown on land where the sulphate of potash has not been applied.

Locusts have hatched in certain parts of the North, and the hoppers will soon make their presence known by the devastation they commit. An article in another part of this issue shows what has been done in other countries to exterminate the pest, or in other cases to diminish the injuries effected by locusts. It is a fact that the greatest part of the injury done by locusts is during that period between the hatching from the egg and the acquirement of wings; and during that time they cannot travel very far, whilst they can be most easily attacked by man or other destroying agencies. The article referred to contains little that is new, but it summarises in a small space pretty well all that is known about the means that can be adopted for the suppression of the locusts.

Grass fires are of frequent occurrence in various parts of South Australia, and considerable damage usually follows. Occupiers of land in such localities have been recommended time after time to organise themselves to devise means for preventing those fires, and to combat them if they should unfortunately break out; but up to the present moment no such organisation has been formed in any place. Surely, in a hot dry country such as this is it would be only rational that the threatened residents in the agricultural and pastoral districts should band themselves to protect their crops, grass, fences, and homes against destruction by fire.

In Germany, Russia, and America the farmers grow thousands of acres of cucumbers, which, when gathered, are assorted into various sizes for pickling. The greater portion of those are salted; but considerable quantities are pickled in vinegar. The pickling is mostly done by wholesale houses; but not a little of the work is done by the growers themselves. Now, there is no better vinegar than cider vinegar, and the apple-growers who now complain of their heavy losses from codlin moth, glutted markets, &c., might do far worse than make apple vinegar and use it for pickling cucumbers. They would sell like "hot cakes" during summer, when people begin to know how palatable they are.

THE PHYLLOXERA BOARD.

The Phylloxera Board reports that the returns of vineyards to date (exclusive of holdings under one acre) amount to 16,948 acres, of which the inspector under the board has examined 11,329 acres, in addition to many hundred small gardens and holdings under one acre in extent.

Everything has been found perfectly free from phylloxera, no traces or suspicious circumstances being apparent. The board, feeling confident that there was no phylloxera in the State, and wishing to guard against any chance of the disease being introduced from the Eastern States, instructed the inspector (Mr. H. Lowcey) to board inter-State trains and steamers to examine all plants, &c., and intercept same if necessary for fumigation.

This has been very successful, as numerous parcels of plants and rooted trees have been inspected and fumigated; but in no case has a vinecutting been discovered.

The board also appointed an officer at Renmark (Mr. Woodham), examining the boats coming down the river from Mildura.

On the 1st October the inspector will proceed to complete the examination of No. 3 District (Nuriootpa to Gawler), after which he will take up the completion in the Clare district at a point where he had to cease last season.

PUT YOURSELF IN HIS PLACE.

The *Nebraska Farmer* prints the following:—

How would you like to be your own horse? Would you work yourself six or seven hours without water when the temperature is in the nineties? Would you let the head of a rivet stand twisted in the harness till it tore the skin off? Would you put a bridle on yourself that had a loose blinker that flapped you in the eye every time you made a step? Would you tie yourself up with a lazy or slower horse which made you pull more than half the load? Would you give yourself water out of a slimy box or a mudhole in the creek where the pigs and poultry bathe? Would you feed yourself dry corn seven days in the week, and hay that smelled of rats, in a manger on which the hens roost? Would you stand yourself at feeding-time ankle deep in your own excrement to fight a million flies bred in your own filth? What *would* you do if you were your own horse?

AGRICULTURAL BUREAU CONGRESS.

The Thirteenth Annual Congress of the Agricultural Bureau was held in the Federal Hall, Grote Street, Adelaide, on Tuesday, Wednesday, Thursday, and Friday, September 10, 11, 12, and 13 respectively. Mr. F. E. H. W. Krichauff, Chairman of the Central Agricultural Bureau, presided over the meetings.

The following members of the Bureau attended one or more sessions:—
 Central Bureau: Mr. F. E. H. W. Krichauff (Chairman), Sir S. Davenport, Messrs. H. Kelly, W. C. Grasby, M. Holtze, C. J. Valentine, A. J. Perkins, W. Lowrie, Thos. Hardy, T. Price, M.P., J. Miller, M.P., Hon. A. W. Sandford, M.L.C., and A. Molineux (Secretary). Amyton: Messrs. W. Gum and Thos. Gum. Angaston: Mr. F. Thorne. Appila-Yarrowie: Messrs. C. G. F. Bauer, P. Lawson, W. Stacey, and W. C. Francis. Arden Vale: Mr. A. W. Fricker. Arthurlton: Messrs. W. Short, W. E. Hawke, and W. H. Hawke. Balaklava: Messrs. G. Roid, E. M. Sage, P. Anderson, W. Tiller, and G. Neville. Baroota Whim: Mr. F. H. Fluggie. Belair: Messrs. G. R. Laffer and O. Nootnagel. Booleroo Centre: Mr. W. H. Nottle. Bowhill: Mr. A. R. Dohnt. Brinkworth: Messrs. A. L. McEwin and J. Stott. Burra: Messrs. E. Goodridge, F. Duldig, and F. A. S. Field. Bute: Messrs. F. Trengove, W. H. Sharman, E. Ebsary, and W. Brideson. Caltowie: Messrs. J. G. Lehmann, A. McDonald, and A. Kerr. Carrieton: Messrs. H. Menz and M. Manning. Clarendon: Messrs. W. Spencer and A. L. Morphet. Cradock: Mr. R. Ruddock. Crystal Brook: Messrs. J. C. Symons and W. J. Venning. Davenport: Messrs. W. Penna and F. B. Rathbone. Forster: Mr. W. J. Sears. Gawler River: Messrs. H. Roediger, A. J. Bray, and T. P. Parker. Gladstone: Messrs. J. A. Gallasch, J. Milne, and W. Brayley. Golden Grove: Mr. S. A. Milne. Gumeracha: Messrs. W. Cornish, W. Jamieson, and J. Monfries. Hahndorf: Mr. D. J. Byard. Hartley: Messrs. A. Thiele and B. Wundersitz. Hawker: Mr. J. Smith. Holder: Messrs. H. Blizzard and J. Green. Inkerman: Mr. C. H. Daniel. Johnburg: Mr. T. Potter. Kadina: Messrs. T. M. Rendell and D. F. Kennedy. Kanmantoo: Messrs. J. Downing and W. G. Mills. Kapunda: Messrs. W. Flavel and G. Teagle. Koolunga: Messrs. J. Button and R. Palmer. Lucindale: Messrs. H. Langberg and E. Feuerherdt. Lyndoch: Mr. F. Warren. Maitland: Mr. John Hill. Mallala: Messrs. J. McCabe and G. W. Bischof. Meadows: Mr. W. J. Stone. Meningie: Mr. Thos. Joy. Millicent: Messrs. H. F. Holzgreffe, H. Oberlander, and R. Campbell. Minlaton: Messrs. E. Correll, M. Twartz, and J. McKenzie. Morgan: Messrs. W. G. F. Plummer and E. French. Mount Bryan East: Messrs. J. Honan and W. Brice. Mount Compass: Mr. H. McKinlay. Mount Gambier: Messrs. W. Mitchell, J. Dyke, J. Watson, and J. C. Ruwoldt. Mount Pleasant: Messrs. R. Godfree, H. A. Giles, and G. Phillis. Mount Remarkable: Mr. C. E. Jorgensen. Mundoorra: Mr. R. Harris. Murray Bridge: Messrs. B. Jaensch, W. Wundersitz, and W. Lehmann. Mylor: Messrs. W. G. Clough and E. J. Oinn. Nantawarra: Messrs. J. W. Dall, Jas. Nicholls, and T. Dixon. Naracoorte: Messrs. S. Schinckel, H. Buck, J. Wynes, and J. G. Foster. Narridy: Messrs. Thos. Dunsford and J. Darley. Onetree Hill: Messrs. J. Flowers and J. Lucas. Orroroo: Messrs. Jas. Jamieson, W. S. Lillecrapp, G. Matthews, and E. Copley. Paskeville: Messrs. A. Goodall, G. Meier, and W. S. O'Grady. Petersburg: Messrs. J. M. Cadzow, H. Earle, W. Miller, and Thos. Selby. Pine Forest: Messrs. R. W. Bawden, F. Masters, and R. Barr, jun. Port Broughton: Messrs. W. R. Whittaker and W. Tonkin. Port Elliot: Messrs. J. Brown, W. E. Hargreaves, and H. Welch. Port Germein: Messrs. G. Stone and A. H. Thomas. Port Lincoln: Mr. Jno. Anderson. Port Pirie: Messrs. T. A. Wilson, P. J. Spain, E. J. Hector, T.

Johns, and G. M. Wright. Pyap: Mr. W. C. Rodgers. Quorn: Messrs. G. Walker and J. B. Rowe. Redhill: Messrs. D. Lithgow and R. Siviour. Renmark: Mr. Ed. Taylor. Reeves Plains: Messrs. J. G. Folland, J. J. McCord, and A. B. Jenkins. Richman's Creek: Messrs. A. Knauerhase, J. McColl, and W. Freebairn. Riverton: Messrs. Thos. Gravestocks, H. A. Davis, and D. Kirk. Stansbury: Messrs. A. Anderson and Geo. Jones. Stockport: Messrs. D. G. Stribling and C. W. Smith. Strathalbyn: Messrs. J. Cheriton, M. Rankine, and P. Cockburn. Swan Reach: Messrs. F. Brecht and W. Hecker. Tatiara: Messrs. Thos. Stanton, W. E. Fisher, and J. Rankine. Watervale: Messrs. C. Sobels and E. W. Castine. Willunga: Mr. W. J. Blacker. Wilmington: Messrs. A. Maslin and M. Gray. Wilson: Mr. W. H. Neal. Woodside: Mr. W. Rabach. Woolundunga: Messrs. T. H. Prosser, N. Rodgers, J. H. Michael, and J. Greig. Yankalilla: Messrs. Jas. Tonkin, J. Crawford, and Jno. Cornish. Yorketown: Mr. J. Davey.

The MINISTER OF AGRICULTURE (Hon. R. Butler, M.P.) delivered the opening address. He said: Mr. Chairman and gentlemen—Last year I had the pleasure of listening to the then Minister of Agriculture, Mr. Batchelor, the two years previous to that I had the privilege of addressing you myself, and I am glad the good sense, I was going to say, of the members of the House of Assembly has enabled me to have the privilege this evening. (Laughter and cheers.) As a farmer myself it is quite natural I should take a deep interest in anything that tends to the development of our natural production, and I hope you, gentlemen, think that the Ministry, as at present constituted, have some knowledge of South Australia, have some interest in its development, and are anxious to do everything possible to improve the conditions of the people, who, in this country as in every other, are the backbone of the State—the producers. (Cheers.) I congratulate most heartily your Chairman, Mr. Krichauff, on being in his present position. (Hear, hear.) I do not think there is any man in South Australia who has a better claim to be considered the producers' friend than your Chairman. (Cheers.) His services as a common-sense and liberal politician for many years in the Houses of the Legislature are known to you all; and during the years he has held the position of Chairman of the Central Agricultural Bureau I am sure he has been actuated by one motive—to do justice to the very important position he occupies. (Hear, hear.) And, gentlemen, I need offer you no apology when I say there is no organisation in South Australia which should do more to assist in the development of our natural industries than an organisation such as our Agricultural Bureau. From the central officers to the, I was going to say, hundred odd Branches which are scattered throughout the State, with a membership I believe of over 1,400, I am quite sure of this, that if this Bureau is doing all that it should do—and I am not going to say that there is not some room for improvement—it is an organisation that should receive the support of the people whom you send to represent you in the halls of the Legislature. The member for the Burra, Hon. Mr. Rounsevell, has tabled a motion proposing that a certain amount should be placed on the Estimates in order to carry out, to put it shortly, agricultural experiments. I have always contended that this Bureau, with Branches scattered throughout the colony, can do a very great deal itself without very much more assistance from the State in experiments of this character. (Cheers.)

A MEMBER: That's true.

The MINISTER OF AGRICULTURE: And if a small amount is added to the vote, say £200, a large proportion of which should be spent on manures, I am satisfied of this, that there are practical men connected with the Bureau, who have seen the advantage of the improved system of cultivation we are now carrying on, who will undertake these experiments, and undertake them in a way that the money will be spent with advantage to the State. (Cheers.) I

know from Mr. Summers, our very energetic Inspector of Fertilisers, that many of you are carrying out experiments at present of this character. But what we want is to be more exact in these experiments, that they should be carried out more thoroughly. I know there is an objection amongst farmers to fiddle with small experiments, half an acre or an acre, just at a time when we want to use our whole strength in putting in our crop or taking it off. I do think in connection with these experiments that they should not be attempted on a very small scale, that those who undertake the work should, with the assistance they get from the Department—such as three or four tons of fertilisers, with railway carriage paid—be enabled to cultivate several acres right through their paddocks. They would, of course, have the produce themselves for the work they do, so that they would not be put to expense in carrying out the experiments for the benefit of their neighbors generally. It has been said that that man is a benefactor to his country who makes two blades of grass grow where one grew before; and I say the man who, by improved cultivation, and by adopting the best and latest improved machinery; who, by spending large sums of money in fertilisers, can double the yield of his land, has equally as much right to claim to be a public benefactor. I think you will agree with me that we producers in South Australia must not go to sleep at the present time. I have travelled a little during the last two or three years throughout Australia, and I do not hesitate to say that our farmers are just as far advanced in progressive agriculture as those of any of the other States. (Cheers.) They are just as ready to accept new methods as the farmers in Victoria or New South Wales; but you know this—in a few weeks we shall have our inter-State duties swept away, and the result will be that while we in this State will have the benefit of the markets of the other States without Customs duties, we at the same time will have to face competition with the other States in our own markets; and there are lines which the other States, having a better rainfall, can produce more largely than we can, such as butter, cheese, and bacon. In connection with our wine and salt industries, and probably some portion of our fruits, I think we shall get as much benefit from the inter-State trade as the other States, but in other directions it will be necessary for us to do the very best we can to improve the quality of our productions; and there is no question about this, as you will see from a few figures I will give you directly. So far as our productions are concerned, we in South Australia have a climate that produces the very best quality, but we are somewhat deficient in quantity. In connection with our butter, I believe that in the European markets it compares favorably enough with the butter from the other States, but when we compare the volume of business done—we export something like 300 tons, and Victoria something like 12,000 tons—you can see what a marked difference there is in the production of the two countries. I look upon it as more than ever necessary that this Bureau should devote itself as much as possible, not only to encouraging a larger production from our various industries, but also the improvement of the quality as far as possible. In London at the present time our fruits, our wines, our frozen meat are attaining a position for which we in South Australia have every reason to be proud. I think our prices in the London market are better than those of any of the States except New Zealand, probably, for frozen lamb, in which there is not so marked a difference in quality, but of which, by many years exporting, they have produced a brand more favorably known. We have only started two or three years.

A MEMBER: Are not the New Zealand lambs more regular in quality than ours?

THE MINISTER OF AGRICULTURE: Yes. I was talking to Mr. Conrad and Mr. Kither the other day, and they told me that so far as the lambs are concerned which we are breeding especially for export, they cannot be beaten

anywhere in the world. (Cheers.) The lambs grown on our natural grasses are quite equal to the best quality of New Zealand. There is no doubt about it that this improved system of agriculture is going to do more for the producers in South Australia, both in connection with cultivation and grazing, than any movement I can recollect during my forty-eight years' residence in this State. To show you what a marked improvement there is in connection with our breadstuffs alone, I find we have exported for the first six months of this year nearly £900,000 worth of wheat and flour, which you can understand, owing to the low price which unfortunately we farmers have to take—2s. 6d. to 2s. 8d. a bushel—means a large volume of business. The figures are £877,000, against £531,000 for the previous year. All the exports for the first six months of this year are larger than those for the whole twelve months of the preceding year. (Cheers.) It is very evident, I think, that the condition of the producers in South Australia is going to improve. I am more hopeful, as a farmer myself, of being able to surround my home with more comfort, especially if I can keep my present position. (Laughter.)

A DELEGATE: We hope you will.

THE MINISTER OF AGRICULTURE: I am hopeful that you will be able to surround your homes with greater comfort in the future than has been the case in the past. (Hear, hear.) I think I can safely predict that such will be the case. Now in regard to our wine industry; this is capable of enormous development. We have thousands of acres in this State eminently suited for viticulture, and I am sure that nobody ought to have any objection to the amount of money that has been taken out the general revenue during the last few years to push our wine trade in the London market. (Hear, hear.) I have always contended that in a matter of that kind you have to consider the indirect as well as the direct advantage. (Hear, hear.) We have spent beyond the revenue we have received, and there is no need to hide the fact, about £20,000 in pushing the wine trade in the London market. I can say that the result has been very great. (Hear, hear.) Not only did we start our London business at the most critical time in the history of the wine industry of this State, but when viticulturists were actually beginning to grub their vines because they could not find a market. We had all that to face, but conditions are different to-day. Now thousands of acres are bringing in a return, and an excellent revenue is being derived from the trade. The London dépôt has given an impetus to the trade, and were it not for that institution the vineyards might have been abandoned. That is a point worth thinking over when the expenditure is taken into consideration. In Victoria they are giving bonuses in connection with the wine industry. Let us look at the two positions and see what result we get from it. The result has been that in South Australia during the last five years the wine trade has practically doubled, while in Victoria under the system I have referred to, it has been practically stationary. Therefore I think you will say we have given every assistance to the State in endeavoring to find a market in the old world for these commodities which we are capable of producing to such a large extent and for which a small expenditure, I think I may say, has been incurred. I do not think that that expenditure should be begrudged by those who are not directly interested in that industry. Now in the past we have been too prone to put all our eggs in one basket. That is a fault we must remedy. We have not thought enough of what I might call our by-products, and which I venture to think in the future will have to be considered. So far as our London dépôt is concerned, if you ask me to show a balance-sheet I confess that I will be many thousands on the wrong side, but if you ask me to show you in what way the dépôt has been of advantage to South Australia, whether indirectly or directly, whether we were not deriving a large revenue owing to the promotion of industries, I would

say straight out that I think it has been a very good speculation. I have said that the balance-sheet would come out on the wrong side, but indirectly the advantage the *dépôt* has been to the community will compensate the people of the State who have contributed towards this outlay. I think that is a fair way to look at the position. (Hear, hear.) Now in connection with our frozen meat industry. I have been told that the establishment of the frozen lamb industry in South Australia has put up the price of beef and mutton. I know this, that before we established that industry we were allowing our boiling down establishments in this State to boil down the carcasses simply to secure the fat. We allowed Messrs. Conrad and others to bring sheep from the other States under bond, conditionally that they did not allow consumers here to have any of the meat, but they should boil the carcass down and throw the meat away to the dogs. I put it to you, is that a fair argument at the present time? Not only in South Australia, but in all the States at the present time beef and mutton are at very high prices, and those prices are likely to continue for some time. Look at the position. Why six years ago there were about 30,000,000 more sheep in Australia than there are to-day. With two or three good seasons we shall again have that number. With inter-State free trade, with our railways tapping not only the pastoral runs in our own State but those in the other States, and, owing to our geographical position, a large number of our lambs must be frozen and shipped to the old world. I put it to you as sensible men whether it would not be almost a national calamity if this export trade which we have built up in this State at a very small cost to the taxpayer should be stopped at the present time? In my own district, and I believe in other districts of the State to-day, there are, I was going to say, three farmers keeping ewes for breeding purposes where there used to be only one. Now let us look at the figures. Our production of lambs has increased from about £150,000 in 1894 and 1895 to quite £400,000 during the last two years. This is mainly due to the opportunities which we have given for the sending of produce to the old world by freezing at Port Adelaide. The time would come again, and very shortly, that we should have to sell our lambs at 4s. in the Adelaide market if we did not have some way of getting them out of the State. During the year previous to the last the department in Adelaide paid over 5 per cent. interest on capital in addition to all working expenses, and then owing only to the delay in completing the works at Dry Creek last year the credit balance this year is smaller, considerably smaller, being about £200 to the good. Then again I contend that to measure the value of that institution by the direct profit which it shows in its working expenses is simply absurd. (Hear, hear.) Why our railways alone, through the carriage of this stock and the carriage of rabbits and other things, have benefited to the tune of many thousands of pounds by the starting of these works. (Hear, hear.) Speaking for myself I do not hesitate to say that my land on the river is worth considerably more to-day as grazing land than before we started this industry. Then the customs and income tax have benefited, and altogether the department has meant a large increased revenue to the State and has improved the condition of the producers, and I want to say that we cannot keep the *dépôt* going unless the farmers support it. (Hear, hear.) If that department—and of course I want to do a little business here to-night. (Hear, hear; and a delegate, "That's right")—if that department is to be the value it should be it can only be by the producers using that department. (Hear, hear.) I have ever since the department started, in 1886, shipped my surplus stock through it and taken the risk of the London market myself. I have no reason to regret it, and now we have spent about £60,000 in putting up a complete plant at Port Adelaide and another large place at Dry Creek I think it would be a very unwise policy on the part of the producers of this State if they sold all

their stock to those who are catering so strongly for this trade and allow it to be taken to a rival establishment when you are all shareholders yourselves in the other establishment. (Hear, hear.) If you do that you cannot expect me to show anything like a creditable balance-sheet. When Minister of Agriculture two or three years ago I got particulars of the prices of meat in the London market for the purpose of acquainting those interested. I do not agree that the prices were always of the best but, I took it that as shareholders in that concern, you have a perfect right to know exactly the position of things. (Hear, hear).

A DELEGATE: Quite right.

THE MINISTER OF AGRICULTURE: That gave you an idea of the value of your produce, and as to the means in the future of getting the best value for it. Now in connection with the wine industry. It will be profitable to those interested in the trade to hear a few facts and figures. A very considerable delay very often takes place in London in selling our shipments of wine. In 1898 50 hhd. were shipped by one of the leading winemakers in this State, and this took Mr. Young, in England, two years to clear. In the first place, that wine was not of the quality which was very easily saleable in London, and the total cost of the shipment was 1s. per gallon. In the beginning of this year, about February or March, a shipment of nearly 3,000 galls. was made to London. It was a light wine which Mr. Young was able to place almost as soon as it was in decent order, within three or four months, with the result that the cost of the shipment was only 10d. a gallon. Another shipment of 10 hhd. of Reisling, which Mr. Young asked one of the winemakers here to send home, was sold on arrival, and the cost was only 8d. a gallon. I give these figures to show you that the longer the wine remains in London so much larger is the expense connected with it. You have extra storage to pay, and it would be well for the wine-growers in this State not to ship their wines too young. It is better for it to be from two to three years old before it is sent out of the State. Now I come to the lamb trade. Last year we received at the depôt at Port Adelaide about 100,000 lambs, and of these we only shipped on behalf of the growers between 6,000 and 7,000, the large majority were bought outside by three or four of the large firms competing for the trade. Of course I cannot tell you what profits they made, but I can tell you what we did, and that will be a guide to you in the future. A small or a moderate sized farmer near Mount Templeton, who was one of the first shippers of lambs through the depôt in 1896, sent sixty lambs this year, averaging 43 lbs. each. He hit the top price in the London market, a little over 5½d. a pound, and we had the pleasure of sending him a cheque for 15s. 2d. a lamb—a very nice little sum. A lot of 200, averaging 35 lbs., realised 11s. 3d. net. They were 8 lbs. lighter than the others. A lot of 144 were grown close to my place, at Mallala—they were ordinary Merino lambs, and averaged 32 lbs.—netted at Port Adelaide 10s. 7d.—a very good price indeed. A lot of fifty lambs—these were the heaviest weights we sent home, rather late in the season when the price had dropped about ½d. a pound—averaged 47 lbs. and they netted the owner 14s. 3d. It is remarkable that the first shipment this year, which reached London in October, brought the highest price, while the previous season the lambs at that time fetched the lowest price. You cannot, therefore, judge one season by another. A lot of 240—these were my own—weighed 35 lbs., and they netted me 12s., about 5d. per pound in London. Right through the piece our lambs, 6,000 of them, averaged very nearly 9s., and with the fat and the skins you may say about 11s. But these lambs we received at the depôt were not average quality lambs. There is keen competition outside for the best lambs, and the quality of these would be much better than that of the smaller shipments which have been made through the department. A result of 11s. per lamb says a good deal for the future of this trade so far as

this State is concerned. The average price in London was 4·78d. right through the season. The highest price was obtained for some lambs shipped by the *Wilcannia* on October 4th, and the lowest price was for a shipment of second quality lambs entirely on December 6th, which averaged a trifle under 4½d. I tell you candidly, taking one season with another, it will pay you just as well to ship your own produce as sell it in the colony. Last year we got about 8s. 4d. to 8s. 6d. net, and this year about 11s.; and any man who shipped consistently through both those years, as I did, got a better average price for his produce than if he sold it here at 8s. 6d. to 9s. 6d. for both years. I want also to tell you a little about the apple trade. I want the department to do more business than it has been doing in the past in the interest of the taxpayers and the growers themselves. We sent through the department nearly 19,000 cases of apples last year; that is, we received them and placed them on board for the shippers. Out of this we sold in London 4,332 cases. I do not know what price you obtained for your apples in this State from the shippers, but I can tell you what the department made net to the growers who trusted them with the business. We netted 7s. 3d. a case right through for the whole lot—(cheers)—but that does not include the packing or the cases. That simply is receiving them at the Port, keeping them in a cool chamber, putting them on board, selling them, and handing over the cash when they are sold. And in looking through these figures—you will see them set out in the agricultural reports which will be published directly—you will see how necessary it is to send suitable varieties to England, and to send only fruit of good quality. The reason we only averaged 7s. 3d. net was that we sold some at 3s.—and expenses had to come off—and some at 6s. and 8s. If 400 or 500 cases out of 4,000 got soft, or if they were too small, it must bring down the average of the whole shipment. I asked the Produce Export Department to let me have the variety of apple which brought the best price, and I will just give two or three figures. The *Cleopatra* sold to 18s. a case. We shipped nearly 2,000 cases, and the average was 12. 8d.; that is gross. Dunn's Seedling averaged 13s. 3d. for 809 cases, a rather high average, and sold up to 18s.; but I think early in the season the *Cleopatra* sold just as well as Dunn's Seedling, but later in the season some bad apples were sent. The *Rome Beauty* was sold up to 16s., and the *New York Pippin* averaged 12s. 10d. and sold up to 14s.

A MEMBER: That's the same as the *Cleopatra*.

MR. W. C. GRASBY: No; it is not the same. [The apple sent from this State under the name "New York Pippin" is the same that is known as *Cleopatra*.—EDITOR.]

THE MINISTER OF AGRICULTURE: Prince Bismarck averaged 12s. 2d., and sold up to 15s. In Mr. Young's report from England this year he has set out the fullest particulars as to the prices made by different varieties, and I am sure it is well worth the perusal of everyone interested in the trade. Apple-growing in this State, if you can only keep the codlin moth in check, is bound to assume very large dimensions. We shipped this year from that excellent fruit colony at Penola some very fine apples. We also shipped largely from Angaston, Clare, and Gumeracha, so the shipments were fairly representative of apples grown in different parts of the State, and I think you will say the prices, considering the much larger export this year and the fact that some of the shipments were not of as good quality as they ought to have been, were on the average fairly satisfactory. You all regret that Professor Lowrie will in a week or two be leaving South Australia. (Hear, hear.)

A MEMBER: We all regret that.

THE MINISTER OF AGRICULTURE: I should like to see him stay very much. He has not been living very far from me. Of course, no man is perfect, not even a Minister of the Crown. (Laughter.) I am sure there is no man who had

the interests of the producers at heart to a greater extent than Professor Lowrie—(cheers)—and we shall find it hard to fill his place, for this reason: that he did recognise that he had a good deal to learn when he came to South Australia—(cheers)—that the conditions existing in this State were not similar to the conditions where he received his education; and those who have watched his career must have been impressed with the fact that he was not afraid during the later years of his work here to admit he had learned a great deal during the time he had been in this State; and I am quite sure, though he does not wish to claim credit for everything, that he has done a great deal throughout in encouraging us—I use the word advisedly, and wish to include myself—to go in for a more thorough and scientific method of agriculture. (Cheers.) In New Zealand he will have a climate and soil not to be surpassed in the world, and there we will see he will have record crops, which he never could have obtained in our comparatively dry climate. But there is no doubt about this: during the last four or five years, in spite of dry seasons, he has obtained from the land at the Agricultural College most excellent returns. (Hear, hear.) Whether more can be done in connection with the cross-fertilisation of wheats, or with more attention being paid to experiments, probably some of you will say yes; but you know we farmers in South Australia in the past have been, as I have said before in my address this evening, looking at the institution too much from the point of view as to whether it is paying its way. I do not know that any experiments carried out at any agricultural college in the world is expected to result in profit. (Hear, hear.)

A DELEGATE: Certainly not.

THE MINISTER OF AGRICULTURE: The very object of that institution is to carry out experiments; and in order to carry out those experiments it stands to reason that those experiments will often result in loss. How can it be otherwise? Still, the knowledge which the farmers get, or should get, and I hope will get to a greater extent in the future, is of great benefit. The value of the experiments lies in this direction; if the experiments that have been tried result in failure it teaches us to avoid the same loss in the future.

A DELEGATE: That is the point.

THE MINISTER OF AGRICULTURE: Yes; and an important point, too. I am afraid I am taking too long, but I want to refer to one more question, and that is the discovery of phosphates in this State. I hope it is going to be a discovery that will be a great benefit to the State. You all know we are importing these phosphates now from, I think, Christmas Island and elsewhere. I think every farmer inside Goyder's line of rainfall will plant very little wheat in the near future without using artificial manures—very little indeed. Speaking the other day in the House I said that while we have used this year over 30,000 tons—I think Mr. Summers puts it at 31,000 or 32,000—that in two or three years, instead of dressing 700,000 or 800,000 acres, 2,000,000 acres of land in our settled districts will be dressed with artificial manures. What will be the result? If the phosphatic rock can be mined and manufactured in this State at a reasonable cost, and the super. produced here for 10s. a ton less, it will mean a saving to the farmers of £35,000 per annum. You carried a resolution here last year, and with which I cordially agreed, that the Railways Commissioner should be asked to carry these artificial manures on our railways at a reduced cost. You will be pleased to know that the Railways Commissioner, at the request of the Government, has agreed this next year to reduce the charges by 15 per cent. (Hear, hear.) Now I put it this way: For every ton of manure carried on the railways 4 tons will come back to the railways in the extra production from the land. (Cheers.) In addition to that a much larger value comes back in connection with the purchase of drills and agricultural machinery, because a farmer never saves. (Laughter.) What he makes

in one direction he spends in another. I was going to say that this question is one of the greatest importance, because you are not going to grow much corn on lands which have been cultivated during the last thirty or forty years without the use of something to bring the soil back to its natural fertility. I have seen very practical evidence of the value and importance of artificial manures to the soil. It is not only of value to land which has been used for many years, but to land of the character of the Yongala Estate. There is no doubt about it that the use of a small percentage of these phosphates tends to largely increase the productiveness of the soil, even though it be new land. What will be the result? Why, if you have 100 families settled in the Yongala Estate the railways will do far better than they are doing to-day, and you will be able to have a land literally flowing with milk and honey. (Laughter.) Just one thing more: The Government have been blamed for not having shipped any oaten hay to South Africa. The reason for that is because the farmers have not grown it. We had an offer some twelve months ago—I was not in the Ministry then—for 3,000 tons from the War Office in London, but we could not supply it. I recognise that South Africa is going to be a very valuable market for many years, and I hope the Government will be able to break down the prejudice which exists as far as our wheaten hay is concerned. (Hear, hear.) I believe it is only prejudice, and the Government is trying to remove it. I have been communicating with Mr. Grainger on this question for some time, having asked him to find a market for wheaten hay. I have received a letter from him in which he says that experiments have proved that what we call wheaten hay is too ripe for transport. The wheat knocks out in travelling, and, as a result, reaches its destination more in the form of straw. That only shows that the hay used is a great deal too ripe. I will tell you what I have done. I have shipped some good wheaten hay to South Africa on behalf of the Export Department, and Messrs. Elder, Smith, & Co.'s agents are going to try their best for us in connection with finding a market for it in the large police force there. I think the experiment will succeed if the shipment is given a fair trial. I do hope we shall be able to remove this prejudice. Now I will tell you some of the items that we have shipped to South Africa to show you what we have done to secure a market for the produce that we can supply. We sent 2,322 tons of hay, 526 tons of jam, 72 tons of potatoes, 71 tons of meat, besides other items. Of course, those figures do not compare with what they sent away from the neighboring States, for the simple reason that we have not the stuff to ship. I think I can say we have the quality, but not the quantity, except in the case of jam, in which we have taken the lead of the other States. I have spoken longer than I intended, but I hope my address has been of interest to you. (Hear, hear.) I hope the facts and figures that I have put before you have proved instructive, although some people question my figures sometimes. (Laughter.) Still, I think they will be of service to you. (Hear, hear.) I am anxious as Minister of Agriculture, as well as Treasurer of the State, to show that I am worthy of the position. (Hear, hear.) I am hopeful, too, that this Bureau will be a more live institution in the future than it has been in the past, and in saying that I am not in any way depreciating the value of its work. I recognise that it is an institution of some importance to the producers and the public generally of South Australia. (Hear, hear.) I am anxious that in the future there will be more community of interest, if I may call it, between the Agricultural Bureau and the Agricultural College, that they should work together more closely than has been the case in the past. (Hear, hear.) You will have observed that there is a movement on foot to establish experimental cereal plots in the State, and in this direction I would like to see a committee formed to consist of members from the Central Bureau and the various Branches, and meet to devise some scheme in order that the money we

are going to vote shall be expended in a way that will be in the largest measure profitable to the community. If these experiments are to be of any use at all they must be exact, and every farmer should be allowed the opportunity of ascertaining the result of them; otherwise very little good will come of them. I am exceedingly pleased to have been able to have addressed you at this Congress on three occasions, and I only hope that I will be in a position to address you in an official capacity many times in the future. (Hear, hear, and laughter.) I notice that you have many important papers to discuss this year. I notice one having for its object suggestions for increasing the usefulness of the Bureau. At this Congress, too, Professor Lowrie will probably deliver his last address to the farmers of South Australia, and of course we all regret that he is going from us. (Hear, hear.) His subject, I observe, is on agricultural matters, and Professor Lowrie is a gentleman specially qualified to speak on so important a subject. On Friday afternoon I have invited the delegates to inspect the Produce Dépôt at Port Adelaide, and the new works that have been erected at Dry Creek. The delegates will see there I think very practical evidence of the development of the dépôt. I hope for many years these works will do much to encourage the export trade. On Monday morning I have arranged for a visit of inspection to the Roseworthy Agricultural College, and I would like the attendance of a large number of delegates, so that they might see what is being done there, and what has been done by Professor Lowrie in the way of agricultural experiment. I thank you for the very close attention you have given me. I hope my address has been of interest to you all. (Applause.)

MR. H. KELLY: I move that our hearty thanks be accorded to the Minister of Agriculture for his able address. I am sure it has been of interest to all. Every farmer I think is pleased that we have such a worthy farmer to represent us. (Hear, hear.) His address showed that he is in earnest over his subject, and that he is a practical farmer. He has shown that he takes a deep interest in agricultural work, and that he is determined to carry out what will be for the producers' benefit. There are several things we farmers want, but of course we cannot always get what we do want at the time. I would like to say a word in reference to the carriage of fertilisers. I earnestly hope the railway freight will be reduced even more than 15 per cent., because if it means an increased back carriage the carriage of manure should be made as reasonable as possible. There is another thing we must all be delighted to hear, and that is that our Minister has determined to put no second-class man in Professor Lowrie's place. No second-class man will answer now, because Professor Lowrie has educated the farmer up to a position which he has not attained in years gone by. We must have a man equal to Professor Lowrie, even if he has to learn something of colonial life and soil. I move with pleasure that the Congress accords a vote of thanks to the Minister of Agriculture.

MR. W. R. WHITAKER (Port Broughton): I have very much pleasure in seconding the motion. I think Mr. Butler's speech has been very instructive, and by his appearance I judge he is very much in earnest over this affair. As a farmer he cannot be otherwise.

The motion was carried with acclamation.

THE MINISTER OF AGRICULTURE: I thank you heartily for your vote of thanks.

Chairman's Address.

THE CHAIRMAN: Before I go on reading my address I would like to dwell on one or two matters which fell from the Honorable the Minister. I think it will be of the greatest importance to all the Bureaus if the suggestion of the Minister is carried out—that we should have returns from the London Dépôt and from Mr. Young, in London. You will then know what has been realised

for the produce of those who have availed themselves of the dépôt, and you may then, perhaps, follow suit. I hope, therefore, that the Minister will see that the information is forwarded in print to all the Bureaus. It ought to be in the office of every Bureau.

The CHAIRMAN then read his annual address, as follows :—

Since meeting you at our Twelfth Congress in 1900, for all those settled on land fit for agriculture a fairly satisfactory year has passed, and, although wool and wheat have been low in price, other farm produce sold well. The prospects for as good or better a season are at present to all appearances favorable.

The Bureau, with its now 108 Branches, has, as heretofore, done useful work, and the *Journal* edited by our able Secretary is greatly improved since. Messrs. D. F. Laurie (the Poultry Instructor), G. Quinn (the Horticultural Instructor), W. L. Summers (the Inspector of Fertilisers), G. S. Thomson (the Dairy Instructor), C. J. Valentine (the Chief Inspector of Stock), Professor A. J. Perkins (the Government Viticulturist), and others have given practical articles on questions within their special knowledge. Unfortunately the year leaves us short of the advice and experience of such eminently practical men as Professor Lowrie and Messrs. Samuel Goode and J. Umpherstone, and science regrets the deaths of Professors Barth and Frank.

While leaving all other matters for our yearly report, I find it necessary, as the usefulness of our Bureau is not admitted on all hands as compared with the expense and what might be possible with the machinery, to show for once that the members of our Agricultural Bureau, without fee or reward, can lay claim to having worked systematically, enthusiastically, and to a considerable extent successfully to instruct how agricultural and pastoral land can best be managed in order that it may carry a larger and a well-to-do population. And this has been done without entering upon politics, chiefly by affording fine opportunities for interchanging opinions and experiences at Branch meetings, Conferences, and Congresses. Useful knowledge has thus been freely disseminated on bare fallows, rolling and harrowing of wheat and other crops, mowing and binding *versus* reaping, ascertaining what varieties of wheat and other cereals were preferable in different localities, rearing and feeding of cattle, horses, pigs, &c., and the value of sheep on farms; also by the distribution of pamphlets on ensilage, dairying, vine and fruit growing, by our *Journal*, by circulars, and by many excellent papers read at Conferences and Congresses. I will only mention papers on "Olive Culture," by Sir Samuel Davenport, K.C.M.G.; on "Cattle Diseases," by C. J. Valentine, Chief Inspector of Stock; on "Irrigation," by J. Colebatch, and by J. West (the Victorian Expert); on "Insects" and "Fungus Pests," by the late Fraser S. Crawford; the many addresses by Professor Lowrie on farming, manuring, and on sheep; many also by Professor Perkins and T. Hardy, Esq., on viticulture; by Mr. Wm. Pearson and by Mr. H. Hart, on fodder plants; by H. W. Hughes and E. J. Hector and others, on lucern; and again many on dairying, tree-planting, and on bees. It cannot be denied that from the above much benefit has been derived, and it is not for want of papers that other cultures, like tobacco, have not made any progress, or that the growth of fodder plants, the making of ensilage and of other provisions for dry seasons, has been yet too much neglected. But is the binding of sand-drifts with Marrem grass not valuable? Are our farmers not using modern implements, especially hundreds of drills, and make now not merely experiments with commercial fertilisers, as hundreds of them are now convinced that they must use them to produce maximum crops on smaller areas to make farming pay? The Bureau can pride itself in having so far prevented, through incessant vigilance and strict regulations, the introduction of many pests which are harassing neighboring States, as the plum leech, phylloxera,

Hessian fly, and others, and has combated others with insecticidal or fungoid sprays more or less successful. The Mount Gambier Bureau has the credit of having destroyed, by constant attention, the few patches of Canadian thistle which threatened to overrun the South-East, as it has done some parts of Victoria. We have also called attention to poisonous weeds and distributed seeds of new useful plants. Who established the field trials of implements and pressed for and obtained the Act compelling an analysis of commercial fertilisers? The appointment of Professor Perkins, who has given such satisfaction to vignerons, is undoubtedly due to the stand the Bureau had taken. The successful growing of osiers on the farm of the Industrial School for the Blind, at Black Swamp, near Queen's Own Town, may be also in some degree owing to several articles which appeared in our journal. The Hon. A. W. Sandford (a member of the Central Bureau) and the General Secretary have attended many public meetings to encourage the formation of co-operative butter and cheese factories, some of the first being those formed at Gumeracha, Woodside, and Strathalbyn as early as August, 1889; Riverton and many others were established soon after visits from the General Secretary. In November, 1889, there were more than a dozen butter and cheese factories about Mount Gambier, and from that time the improvement in butter, cheese, and bacon-curing dates. The visit of the late Mr. J. Wilson and the travelling dairy helped greatly. Mr. Thomson testifies that many of our dairy cows are now as good or better than in the other States, and this is a natural consequence of the purchase of stud bulls by some of the Branches of the Bureau and the loan of others by the Government to the care of some of the Branches of the Bureau. We have always asked for inspection of dairies and slaughter-houses and the licensing of stallions. Indirectly we have assisted, through fostering a greater feeling of unity among the rural settlers, the Co-operative Farmers' Union. Papers on fruit growing, preserving, and drying have been numerous, and many members, especially in the Village Settlements, have been eminently successful in that direction on a scale above expectation. The keeping and packing of fruit for export has been much improved. The naming of the best varieties for export has increased the planting of these both as regards trees and vines. The visits of viticultural experts has encouraged plantations of vineyards in new localities in no small degree. The Emu Flat plantation was at first a success and only subsequently neglected. In the Ninety-mile Desert are doubtless many places where, with its fair rainfall, the soil is suitable for intense cultivation. And is the information on various subjects which the numerous visitors obtained at the office of the Central Agricultural Bureau and by letters to be counted for nothing?

At one of the first meetings of the Agricultural Bureau, in the year 1888, the establishment of an arbor day was discussed, and I myself read in February, 1889, a paper on what I had observed in 1882 in the Great Platte Valley, in the United States, and on the encouragement arbor days had given to tree-planting in Nebraska. One farmer there planted 14,000 trees in one year, and altogether 200,000 of cotton-wood (*Populus canadensis*), white ash (*Fraxinus*), and other trees. The planting in Nebraska has already influenced the climate to some extent by an increased rainfall, and shelters now numberless farms in a country formerly entirely treeless. After an arbor day, arranged by the Bureau and the City Corporation, on the park lands of Adelaide, others have been held in ever so many places in this State, chiefly in connection with schools; but, unfortunately, the number of trees planted is never large, and those growing to advantage still smaller. An arrangement for a combined visit of the present young men and women who attended these arbor days during their school-going days would, however, doubtless be useful, as showing them how the trees have grown in but a few years; and, even if they should not become planters, they are sure to be protectors of trees for all future time.

Of course, in thus enumerating what has been accomplished by the Bureau, I have not exhausted the subject, but *verb. sap.* Imitations of our Bureau elsewhere should sufficiently prove its usefulness.

There are, however, matters of great importance which are still rather neglected, and I mention them, as this cannot be too often repeated.

Our climate, on the whole, renders it not compulsory to house stock at any time, yet more shelter should certainly be given during some of the coldest months, and shade during the heat of summer. You will thus keep your stock in better condition and economise feed. Forage plants are, unfortunately, also not sufficiently valued. Cape barley, Algerian or Calcutta oats, rape, and mustard, for feeding stock during the winter, or maize at other times, are mostly sown in only small plots, and I will mention some others that are also too much neglected. Sorghum is sown thickly at three different times broadcast in many parts of Victoria, mostly in September, November, and December, so that the fodder is ready one crop after another. In New Zealand peas or beans are grown alternately with wheat with great success; but here such is more the exception than the rule, even in districts where this can undoubtedly be done as well. Again, the hairy vetch (*Vicia villosa*), which has been reported upon by our Bureaus as being valuable, should be used more as a forage or a green manure plant, for it seems to be drought-resisting on moderately dry lands, and when sown with oats makes vines up to 5ft. long. On rather heavy soil this vetch gives in California about 8 tons of hay, and thrives even on soil too poor and dry for corn when once established. Another nitrogen-gathering fodder plant, *Trigonella fœnum græcum*, although repeatedly recommended, has apparently not been tried here. In Algeria, with a similar climate, some acres have of late years returned in two cuttings from 18 tons to 32 tons of green forage.

How many have in real earnest cultivated our native saltbushes, which are so greatly valued in South Africa and California? Thousands of acres are grown there; but it is, as the old proverb says, "The prophet is not without honor, except in his own country." The best kinds, which seedsmen may or may not have in store, are *Atriplex semibaccata*, *A. nummularia*, *A. leptorarpa*, *A. vesicaria*, and *A. halimoides*. The last two species, being natives of our central deserts, seem best for the driest parts of the State. The Stansbury Bureau, as early as February, 1889, stated that *A. semibaccata* was growing freely in the driest weather in that district, and cattle and sheep relished it; but has it been cultivated there as it deserves to be? Where seed has to be sown in quantity the best plan is to sow on the surface when wet with rain, and, while the soil is still warm from the summer heat, drive at once a flock of sheep over the land. These will press the seed in, which need none or only light covering; but the birds must be kept off. We certainly have not too many useful fodder plants that will grow on the poorest alkaline soils, and may yet produce up to 20 tons of green feed, or 5 tons of cured forage, per acre, with almost the same nutritive value as lucern.

Instead of growing fodder plants many rely almost entirely on stubble and weeds, and the extermination of the latter is necessarily neglected. The adage that "A stitch in time saves nine" is in no case more literally true in regard to weeds. When in many instances sheep are turned in after harvest the ground is probably before that time reseeded for thousands of plants that will make their appearance next year when the land is under crop. Only too frequently we have no early rains that make them germinate before ploughing and sowing, and dirty crops are the result. Instead of depasturing on weeds it is better to follow up the very interesting experiments made by Professor Somerville, of Cambridge University, on permanent pasture. There is a great difference in quantity and more so in the quality of fodder. He has compared

not merely the weight of grass and herbage after manuring with different fertilisers, and as this quality of the fodder cannot sufficiently well be ascertained by an analysis the animals depastured on land fertilised similarly had to give him the answer by their increased weight within a given time, or by the quantity of milk and butter fat obtained from cows. During the first year the results are generally not very striking after manuring pastures. When he placed eight sheep in each of ten plots, containing $3\frac{3}{8}$ acres each, he found those placed there during the first summer did not nearly gain as much weight as other eight in the second summer, and yet other eight in the third summer in 1899. It was found that 100lbs. of phosphoric acid per acre, given in the form of 5cwts. of Thomas phosphate, gave nearly as good or slightly better results than 100lbs. of dissolved bones with 17lbs. of nitrogen, or 100lbs. of superphosphate even in conjunction with 1 ton of limedust, or with 34lbs. of nitrogen in sulphate of ammonia, or with 100lbs. of potash in sulphate of potash. Plot 3 was fertilised with 200lbs. of phosphoric acid and in the form of half a ton of Thomas phosphate, and the live weight increase was 153lbs. against 46lbs. from the unmanured plot; 35lbs. of hay from the latter produced only 1lb. of live weight increase, while 21lbs. of hay from plot 3, or from superphosphate plus potash, gave 1lb. live weight. The net profit from 100lbs. phosphoric acid was a little over 30s. per acre, from 200lbs. over 55s. (according to a valuator's figures), and over 85s. according to weight. The net annual value of poor pasture was thus raised from 5s. to 30s. per acre where half a ton of Thomas phosphate was applied.

It occurs yet here and there that it is stated at our Branch Bureau, that an application of phosphatic manures had given no increase in the crop, and consequently a loss was made instead of a profit. This shows clearly how much some farmers have yet to learn. Not only unfavorable weather may reduce the crop on a fertilised field, but also as often that fertilisers were given at the wrong time, or that the soil required lime, or one or both of the other plant foods. The mere use of fertilisers is almost impotent to counteract unfavorable seasons of either drought or cold; but some of the fertilisers are not lost for subsequent crops, and even less so in localities that had a scanty rainfall. As an instance, I may mention that after the crop of wheat had been totally destroyed in 1896 by drought at the farms of the University of Columbus, United States, land which had been sown for nine years in succession with wheat, and which had received no fertiliser in 1897, yielded in that year 39bush. of wheat per acre. The cause of an unpayable return may be in other cases the exhaustion of one of the plant foods after many years of cultivation; for although here the dominant factor is mostly in the first instance phosphoric acid - and if Thomas phosphate or bonemeal is used the residual value should also be considered for subsequent crops—it is quite probable that in the more sandy soils of this State the proportionate available potash has been exhausted, or that the addition of nitrogen to the phosphatic fertiliser would give a greatly-increased crop. Mr. Dorward, of Port Lincoln, reported that by using 2cwts. of kainit per acre he had from 6bush. to 8bush. more of Scotch malting barley, or 25bush. in all per acre. That nitrogen increases generally the crops is shown by wheat after peas, and the nitrogen gathered by the latter from the atmosphere is probably not so easily leached out as the expensive nitrogenous commercial fertilisers when not at once used up. But it is improvident for all that to purchase a complete fertiliser in a blind and haphazard manner as many would a patent medicine. A farmer must obtain the knowledge from his own soil what kind or kinds of plant food are required. Let each portion of the farm or garden have in turn a share of the farmyard dung, so desirable for the formation of humus and the improvement of the physical state of the soil, and you ought to obtain in ordinary

seasons, with the addition of commercial fertilisers to the next crop, the best results. It is, however, by no means certain that you will get these where you applied the several plant foods in the same ratio to each other as they are found by analysis of a crop, for it is generally, or may at least be much less than what may be required for a maximum crop. The Ohio Experimental Station gives the following proportionate analysis, viz. :—

Water in the grain and straw of oats, 20·2; phosphoric acid, 1·11; potash, 1·88; nitrogen, 2·53
Water in the grain and straw of wheat, 19·10; phosphoric acid, 1·36; potash, 1·36; nitrogen, 2·72

The same report states also that "the addition of an abundant supply of nitrogen nearly doubles the effectiveness of a pound of phosphoric acid, and the presence of an abundant supply of phosphoric acid more than quadruples the effectiveness of a pound of nitrogen, and when both phosphoric acid and potash are present in ample quantity, the effectiveness of the nitrogen is still further increased."

So we learn from the experience and experiments of others much that will lead us to think and to regulate the applications of fertilisers, which we all admit to be the salvation of our grain-growing, and makes us look with ever-increasing hope to the future.

THE GENERAL SECRETARY: I may point out that for over thirteen years we have dispensed with the practice of passing votes of thanks, and I hope this Congress will follow the practice. I rose after the Chairman spoke so as to prevent waste of time. I thought it best to do so here, and I know the Chairman will forgive me.

It was decided to dispense with vote of thanks at conclusion of each paper.

MR. A. L. McEWIN (Brinkworth): Although not agreeing with all that was said in the paper, it was, nevertheless, a very valuable one, and contained a lot of useful information. It should certainly promote discussion. One question that was strongly discussed at our meetings last year was that relating to the licensing of stallions. I think this question should be thoroughly discussed in every Branch of the Bureau, and at the same time try to get as many farmers as possible to come to the meetings. I believe the Bureau meetings are sometimes not interesting. They should be made more attractive. We should discuss questions of interest. I question the statement I heard a number of gentlemen make: that our breed of horses is going back. It is discouraging to men who have spent thousands of pounds in connection with the horse-breeding industry to hear such a statement as that. I believe there are better horses in South Australia to-day than there were fifty years ago.

A DELEGATE: Never.

MR. McEWIN: I say there are. This matter was discussed at the last Congress, and a motion was carried by a majority of twelve in its favor. As far as I can recollect, those Branches that did take the subject up were against the licensing of stallions. I would like to see all the Branches of the Bureau take up the matter and discuss it properly.

THE GENERAL SECRETARY: The question has been discussed by all Branches, and the majority of them decided that it would be a valuable thing for the horses to be previously examined and then certificated. In regard to your suggestion that it should be properly discussed, I presume you mean by the other side. It has already been discussed and decided in the way referred to.

MR. McEWIN: I would ask the General Secretary how many Branches of the Bureau have discussed the question? In my opinion, not one-third of the Branches have discussed it.

THE GENERAL SECRETARY: I think about eighty-seven Branches, and the majority were in favor of the proposal.

MR. McEWIN: There is one matter the Chairman touched on—the shelter of

stock. Out on the Hallett Plains you sometimes see no more feed than there is on this floor, and yet stock will do better there than where they have abundance of feed.

Mr. R. CAMPBELL : Oh, get out with you.

Mr. McEWIN : Good level open country is better than any sheltered country where there is plenty of feed. I have been brought up within sixteen miles of Adelaide, on the Little Para, on as good country as there is in South Australia. It is supposed to be the very best grazing country there is. Three-year-old cattle there are better than five-year-old cattle in the hills. I believe sheds are the very best shelter we can put up.

Mr. W. R. WHITAKER suggested that a time limit should be placed on the speeches, and it was decided that speakers should be allowed five minutes each, and movers of motions three minutes for replies.

Mr. W. G. F. PLUMMER (Morgan) : I am always glad to hear an address from Mr. Krichauff, because he always gives us some practical information. In reference to his remarks about saltbush, a member of our Bureau had experience in sowing saltbush seed, and he finds that when it is sown by hand it does not do so well as when the seed is stamped into the ground by the hoofs of animals.

Mr. JORGENSEN (Mount Remarkable) : I have tried that myself, and have found that seed scattered about the paddocks and not attended to grow. I think we get most valuable information from our worthy Chairman. I consider that without the Bureau and the experiments conducted by members Professor Lowrie would not have succeeded as he has.

The GENERAL SECRETARY (Mr. A. Molineux) : Mr. McEwin has made some statements with regard to the effect of tree-planting with which I cannot agree. Within my lifetime and that of this State the Khedive of Egypt has planted millions of trees on the Nile Delta, and the annual rainfall has increased from four days to forty days since the trees have been planted, and that state of things can be recorded in hundreds of cases ; and for one man to say that in his opinion tree-planting has no effect whatever—well, it bears very little weight against the facts of the case and the recorded experience of scientific men.

Mr. R. CAMPBELL (Millicent) : I am pleased that the Government have placed on the Estimates a sum of money to carry out these experiments. Some years ago, in connection with Professor Lowrie's work, there was an experimental plot at Millicent, and great interest was taken in it. It did much more to encourage the use of fertilisers in our district than all the reports that appeared in the papers, simply because it was local. The growth of gorse might well be experimented with, at any rate in the South-East, in the stringybark, peaty country, where it could be grown. Everyone looked upon it as a useless weed, but I read in a New Zealand paper some years ago that it was anything but that. The paper gave an instance where a man had a block of land that could carry only 300 sheep, but by sowing gorse it carried 2,000 sheep. The experiment might well be tried, and if successful the money would not be wasted. Plots could be established and the experiment given a good test. (Hear, hear.)

The CHAIRMAN : I might inform you, gentlemen, that an experiment is in the course of being made, on five acres and six acres respectively, at Seppeltsfield and in the Moppa Scrub, between Kapunda and Nuriootpa. I hope the result of this will be that the experiment will be carried out more extensively. Men like Mr. Seppelt and Mr. Domeyer are willing to undertake this work, because they have their heart and soul in it. I hope other people will have sufficient courage to imitate the experiment, so that it will be given a fair and proper trial.

WEDNESDAY, SEPTEMBER 11.

The sittings of the Congress were resumed on Wednesday morning, Mr. F. E. H. W. Krichauff (Chairman of the Central Bureau) presiding over a large attendance.

Co-operative Dairy Factories and Private Separators.

Mr. R. CAMPBELL (for Mr. J. Davidson, Murrumbidgee Factory, Millicent), read the following paper on "Co-operative Dairy Factories and Private Separators."

The rapid development which has marked the rise and progress of the dairying industry in South Australia, Victoria, New South Wales, and New Zealand has been due in the main to co-operation amongst the farmers. It is the co-operative factory system that has built up the enormous export trade in butter and cheese which exists in Victoria and New Zealand to-day. In the latter colony during the past year the annual export income for cheese alone was £205,000, and we are all familiar with the tremendous proportions of the yearly butter export from our sister States. In any of them, previous to the factory system, we can find hundreds of farmers who were almost in a state of penury, but have now attained to comfort and affluence through the practice of co-operative dairying.

Pure co-operation can only exist where a community of individuals mutually agree to throw in their lot and unitedly work for the common good of each other. In so doing a few monetary sacrifices must necessarily be made at the outset, but which will eventually redound to the ultimate good of the whole. Apathetic indifference on the part of members is a heavy drag on the progress of many co-operative dairy companies. Shareholders are often prone to forget that they are part and parcel in the ownership of a factory, and that their individual effort and support is required to make it a success. What has proved a great menace to the spirit and welfare of co-operation as applied to cheese and butter factories in the several States mentioned is the introduction of private separators in districts having a factory within close proximity. No other circumstance than this is militating so much against the progress of factories in Victoria and New Zealand, and in South Australia its baneful influence is being strikingly felt. A man who open-eyed invests capital as a shareholder in a co-operative concern is in duty bound to support it to ensure success; any deviation engenders indifference on the part of others, and courts ruin. Be loyal to your own factory. Admitting that it is possible for a shareholder, during a short season in the year, by butter-making at home to make a few shillings more than he would obtain at the factory for his milk, he is not justified in so doing at the expense of the company of which he is virtually a co-worker, and which buys his milk in season and out of season. It is an undisputed fact that many farmers throughout this State have derived much of their possessions and prosperity through the medium of their local dairy factory, and hence there is good reason in asking them to support that which has supported them. By making their factory prosperous higher prices will be got for milk, and substantial dividends for money invested.

Let us consider for a moment what we owe to the factory system in dairying, not going further than our own State. Previous to it the Adelaide market was glutted with butter of all conceivable grades and flavors for a few months during the flush of grass, when the prices ranged from 4d. to 5d., while tons of it were disposed of for grease, at prices under 3d. per pound. Then in the summer months the opposite extreme was reached, when the commodity bordered on famine prices of 2s. 6d. and 3s. per pound. But "old things have passed away," and we have now a reliable and steady market, without these ridiculous fluctuations—a market that we can depend upon within a trifle at each corresponding season. And what is it due to? None but the co-operative factory system and, as a result, the Export Department, which has opened to producers the markets of the world, whereby our surplus is got rid of. By these agencies the production of butter and cheese has been multiplied a hundredfold.

In order to secure a large quantity of butter that will pass the standard test at the grading ports it must be of uniform good quality and made by up-to-date methods of manufacture. A consignment made up of forty different shades of color and as many flavors would spell ruination to the export trade, and our name and brand would be avoided by the London consumer. By the application of scientific methods to dairy work, cream-ripening, pasteurising, and refrigeration are now every-day means employed to attain uniformity in quality and flavor of butter, and while these agencies are working for their good many farmers are, perhaps unwittingly, pulling in the opposite direction. Despite the amount of practical advice given from time to time by experts in this and other States, we find many farmers buying separators for home use, and sending their cream to some far-away town factory to be made up with cream at various ages from many other farms. Under these circumstances there is frequently a conglomeration a week old—rancid, overripe, and bitter—from which it is impossible to make long-keeping, full-quality butter. During transit by road and rail the cream is often half churned and overheated. I note that the chief cause attributed by the expert to the deprecia-

tion in quality of Victorian butter is the advent of the private separator. If we hope to gain and retain pre-eminence in the home market our first duty is to avoid the practice that has brought about disaster in the sister State. It can safely be said that thousands of pounds value is annually lost in South Australia by the manufacture of inferior butter from cream spoiled by careless handling. As the central factories established in large towns have to compete for the supply of cream, almost anything is accepted that comes along, and turned into butter for export or local sale. The centralisation of trade in the cities that properly belongs to the country should be discouraged.

Where a dairy farmer is situated within a radius of six miles from a good factory it will pay him much better, taking good and bad years together, to send his milk to the factory. When he takes into consideration the cost of separator, wear and tear, hand-turning, making of butter, or cartage of cream to the station, he will come out the loser in the end, in addition to retarding a great industry which has done so much for the country in the circulation of a large and ever-increasing amount of money. Where the roads are impracticable or distance too great no objection can be raised to a farmer investing in a separator, but not unless. The factory system is much better for the welfare of the industry as well as the individual.

The objections to the private separator as compared with the delivery of milk to a factory may be summed up as follows:— (1) It is detrimental to the proper success of existing factories and production of a uniform article; (2) there is a tendency to carry cream too far and keep it too long, so that it arrives at the place of manufacture in an advanced state of fermentation, depriving the buttermaker of the advantage of being able to properly control the ripening of the cream, without which good butter cannot be made; (3) the manufacture of various inferior qualities; (4) the loss of benefits of association with others in the industry; the spirit of emulation is not engendered as when suppliers meet together frequently, nor is there any community of interest, such as is desirable in dairy factory work. For these reasons the private separator is a barrier to the true progress of the dairying industry.

The Hon. A. W. SANDFORD, M.L.C., who was called on by the Chairman, said: I would very much rather that some of our country friends, who have studied dairying both theoretically and practically, spoke first. By theoretically I mean those who have studied the question whether the factory or the private separator is best. No doubt there are some here who run private separators, possibly some who have taken their milk to the factory in times gone by, and who are now running a private separator, who can give us their opinion and practical experience on both sides of the question. I am sorry Mr. Davidson is not here, although I have no doubt we have in Mr. Campbell one who has watched the factory system, and who will be able to give us information of this system of private separators. But it is a pity that the writer of the paper is not here, because I think he could be convinced that the attitude taken up in this paper is hardly a wise one in the best interests of the industry. There need be no such thing as conflict between the factory system and the private separator. (Hear, hear.) They should run alongside each other. They do not exist in many places to come in contact. Where the farms are small and dairying is extensively carried on you find factories established, and the majority of cow-keepers are prepared to and do cart their milk to the factory; but what about the great extent of this country where there are no factories? Of course the writer says if there are more than six miles—I do not know why he takes that distance, because I know some distances of two miles in the hills that would be a bar to the carting of milk. I would like to have the experience of those who have carted milk to the factories and are now running private separators, and though incidentally the adoption of the hand separator may stop the progress for the time of some of the factories, on the whole it has done more for dairying in South Australia than the establishment of factories. I say there is more butter turned out in South Australia from cream that has been carried than from milk that has been treated at factories. If anyone doubts this, I would like them to ask me any questions they may have after I sit down. I am prepared to prove this statement by figures that would not be doubted, coming from sources that could easily be checked, so it is not wise for us to place these two systems against one another and make them appear to be antagonistic. I did not see this paper until Mr. Campbell began to read it; otherwise I might have come better prepared to combat some of the

statements in it. Of course, there is a great deal in this paper which is really good sound advice, and there are only a few points in it that one can take exception to; so, Mr. Chairman, you will understand that in criticising this paper I am not doing it for the purpose of condemning the paper. I say it is generally right, but the fault is that it sets up an antagonism between two friends—the private separator and the factory. In the second paragraph you will see what is a very nice platitude:—"Pure co-operation can only exist where a community of individuals mutually agree to throw in their lot and unitedly work for the common good of each other." That is very nice. We have heard it a good many years. It is misleading here because there is not one co-operative factory in South Australia to-day, I am sorry to say. They are all joint stock companies. You had one co-operative factory in the Gumeracha factory; but after working for several years the directors had to get the permission of their shareholders to alter it to a joint stock company, in which farmers may and do hold small interests, and yet are large suppliers; or, on the other hand, the local doctor or storekeeper may hold a good many shares, as I could name to you in some of the Hills companies, and yet send not a pint of milk to the factories. And so the system of co-operation does not exist.

MR. R. CAMPBELL: There is no reason why it should not.

HON. A. W. SANDFORD: That is a nice interjection, and I am glad Mr. Campbell made it. If I thought by staying here and talking for three hours that for the rest of your lives you would all co-operate, instead of working individually, I think I should have a try; but abler men than I have tried it for scores of years and have not succeeded, and I think our time is a little too short for me to try to do such illusive work. I will close this portion of my remarks by saying this reference to co-operation will mislead many, who will think that the factories of this State and the neighboring States are on co-operative lines. Of course, further down he says:—"Admitting that it is possible for a shareholder, during a short season in the year, by butter-making at home to make a few shillings more than he would obtain at the factory for his milk, he is not justified in so doing at the expense of the company of which he is virtually a co-worker, and which buys his milk in season and out of season." I quite agree with that remark. I think it is a mean thing for a supplier of a factory to run away and deal directly with his butter, in order to make, if he can, 1d. or 2d. out of it, and take it to the factory when he cannot do as well. And the factory companies should protect themselves against that, and they can do it by any one of half a dozen methods. Let them give a bonus at the end of the year—pay a little less during the year—to the man who brings all his milk. There are half a score of ways that might be tried, and I say it is worth our while considering it, because there is no suggestion that a man is benefiting more week in and week out by treating the milk himself than by sending it to the factory, because it is undoubtedly your duty to yourself and the industry to do with the milk as you can make most money out of it; and if farmers can make more by making butter at home and selling it to the storekeepers, they have a perfect right to do so. In the North many send the butter direct to Broken Hill. You would not say that those people should be compelled to send their milk to a factory, to be made into butter, when by sending it to the second-best market they can make more out of it. Further down this very excellent paper I see Mr. Davidson refers to the application of scientific methods to dairy work—cream-ripening, pasteurising, and refrigeration. It is in this line and this advice that the future success of the factory system in this State and the neighboring States lies. It lies here, because if the best appliances, the best of methods of handling are adopted, the factory will be able to make more out of a man's product than he can by handling

it himself, and surely will be able to pay as much for it as he would get if he took all the trouble of manufacturing the butter. It is therefore, I say, not any coming into conflict with the private separator, or saying that a person situated in the dry North, far from a factory, shall be prohibited from keeping dairy cows or handling butter. I think the intention of the paper is good. If the private separator is to be abolished what will become of many of our northern farmers? Scores of them, I may say hundreds, have kept the pot boiling during the past bad years with a few cows. (Hear, hear.) In the same paragraph it is stated—"Despite the amount of practical advice given from time to time by experts in this and other States, we find many farmers buying separators for home use and sending their cream to some far-away town factory to be made up with cream at various ages from many other farms. Under these circumstances there is frequently a conglomeration a week old—rancid, overripe, and bitter—from which it is impossible to make long-keeping, full quality butter. During transit by road and rail the cream is often half churned and over-heated." There are no doubt disadvantages arising from the hand separator. One of the disadvantages undoubtedly is that in unsatisfactory weather and the imperfect means that we have for sending cream long distances the cream sometimes deteriorates in transit. But do not the same disadvantages exist—and I maintain to a greater extent—in sending down your butter, seeing that at times it is held over for a day at a break of gauge, and when arriving in town it can hardly be called butter at all? It occurs then that you have the same difficulties to contend with in the transport of your butter as in the transport of your cream, and to a larger extent because cream can stand carrying better than butter. Where the cream has been sent away fresh from the farm it is in reality going through a necessary process in transport because it is ripening. The probabilities of depreciation are greater in the case of the transport of butter. What depreciates the value of factory butter is bad butter, because less is consumed. Put a pound of good butter on the table and see how long it will last with a big family. (Laughter.) Then, if you want to see the reverse, put a pound of bad butter on the table for consumption; you would have a job to get rid of it. Now let me give you an instance as to the value of hand separators, and in support of my contention that the hand separator and the factory should work hand in hand. Here are some figures as to the average prices realised in what I consider to be the worst month of the year, January. In one establishment over 32 tons of butter were made in that month from cream received from long distances. Now what was the result? Out of that quantity 60·2 per cent. passed out first grade butter, 32·2 per cent. second grade, and 7·6 per cent. third grade. The average prices realised for the month were—First grade, 14d.; second grade, 12½d.; and third grade, 11d. See the advantage that was gained during the month of January owing to the hand separator. Take the saving in cartage; I have no doubt that many farmers deliver their milk to the factory twice a day, and that keeps a boy and a horse and a vehicle pretty well occupied to do so.

A DELEGATE: Some deliver only once.

Hon. Mr. SANDFORD: Then it is not to the best advantage; it does not give you ideal conditions for making first-rate butter. Where the highest grade butter is made there must be at least two deliveries.

A DELEGATE: That is a disadvantage to some farmers.

Hon. Mr. SANDFORD: Exactly; that is the very argument in favor of the hand separator. It is where the farmer has long distances to travel that the advantage of the hand separator is felt. There is another point I wish to make, and one which has not been touched upon here, and one that is an important factor in deciding this question. That is the sweet milk that can be retained for the calves. (Hear, hear.) You will not have good calves unless you rear them on

sweet milk. I heard a dairy expert say that he could go through the country and tell where the hand separator was kept by the look of the calves, while in the neighboring States I have heard farmers speak of the advantage of skim milk for calves. It might be said that you would get the milk back from the factory. Theoretically that might be done; practically it cannot. The milk is sour and thick, and the calves will not do well on it.

A DELEGATE: Why not take the calves to the factory?

HON. MR. SANDFORD: It would be useless to take the calves there unless you could take the pasture with them. I contend that where the farmer has long distances to travel it will pay him better to work the hand separator. To my mind the advantage is obvious. Then you get higher returns by the use of the hand separator in conjunction with the factory; and this has been shown, not only in Australasia, but all over the world. The output is greater. The hand separator has been a boon to the farmers, and has kept many a home. I regret that Mr. Davidson is not here himself in order to justify some of the statements made in his paper. In the concluding paragraph Mr. Davidson sums up his contentions under four points. He says—"The objections to the private separator as compared with the delivery of milk may be summed up as follows:—(1) It is detrimental to the proper success of existing factories and production of a uniform article; (2) there is a tendency to carry cream too far and keep it too long, so that it arrives at the place of manufacture in an advanced stage of fermentation, depriving the buttermaker of the advantage of being able to properly control the ripening of cream, without which good butter cannot be made; (3) the manufacture of various inferior qualities; (4) the loss of benefits of association with others in the industry; the spirit of emulation is not engendered as when suppliers meet together frequently, nor is there any community of interest such as is desirable in dairy factory work." In my opinion the spirit of emulation is much more exciting in the hand separator than at the factory, where there is no distinction between the man who has a good breed of cows and the man who has not, because they get equal payment. In regard to the second point, I would ask you to note that in spite of the long distances, over 60 per cent. of the cream that reached the establishment to which I previously referred in the month of January made first quality butter, and topped the market in Adelaide. That is an important point. The fact that the cream made such excellent butter I think bears out my previous statements. This was not in a few instances only. I may say that it practically came during the month from 1,039 consignors. Mark you, that must be divided by four—weekly consignors—and many of them sent every week. There were 300 families who received the benefit from this one source alone. I can safely say that out of the 300 families the pot in a large number of homes was kept boiling where the wheat crop had miserably failed during the last season. I therefore say that while the factory system has its place so has the hand separator in this country, and instead of putting one against the other both should be encouraged for the benefit of the industry. (Cheers.)

THE CHAIRMAN: I must draw attention to a resolution that no one must speak more than five minutes. I gave special permission to Mr. Sandford because I thought he would certainly be best able to answer the question that has been prepared by Mr. Davidson, and you would then have both sides before you.

MR. W. CORNISH (Gumeracha): I think we have before us a very important matter which requires our best consideration. I agree in the main with the remarks in the paper, and I am very much surprised at the remarks coming from Mr. Sandford. I think when we established the factories our object was to get a uniform quality of butter to send to the home market, and if we continue with the separators we shall have all kinds of butter; and it is no wonder

our butter in the English market is not holding its position, and complaints are made that it is fishy and that it has objectionable tastes. My experience with the factories—and I have had experience with them ever since they started in South Australia—is that the separators are to a great extent going to ruin the factories.

Hon. A. W. SANDFORD: No.

Mr. CORNISH: The financial position of the factories and the quantity of milk they are getting in during the winter months are clear proofs that the separators are very much injuring the factories; and as regards many of the complaints made, well, they are not worth considering. At any rate, the distances for carrying the milk do not effect the dairyman very much. He can go twice or three times a week with his cream if he wants good butter, and we can take our milk there in good quality fit for separation in the factories, and go only twice or three times as it is. So far as loss sustained in going to the factories is concerned, I wonder why it does not pay a dairyman best to send in his milk and get a price for the whole of it, or take part of it there and get a second price. Many have to take a second price because the cream is unfit for the factory. As regards calves: I never had a separator, and have had as good calves as anyone in the country. You can get the milk from the factory and take home for the calves.

Hon. A. W. SANDFORD: How far from the factory are you?

Mr. CORNISH: Not very far. If we wish to injure the quality of our butter we cannot adopt a better system than get the separators. I regret that some of the strongest supporters of the factories who at one time condemned them, now have the separators, and our factories are idle because all around separators are at work. I say the separators are doing us a great injury. I hope in future the milk will be delivered to the factories, so that we will have a good quality of butter.

Mr. J. BUTTON (Koolunga): At Koolunga we had agreed to start a factory. We failed to form our factory, and one of the farmers said he would get a separator if we would support him. He received thousands of gallons, and paid us for our milk. If we had had to wait for a factory we would have been as before, but we have been able to have the milk separated and the cream sent on to Adelaide or any other place. That gentleman advises other people to get separators, and he still receives a lot of milk. It is carried into Koolunga and separated by Mr. Jones. He did us a great benefit in getting that separator. If the factories paid full price for the milk separators would not interfere with them.

Mr. W. GUM (Amyton): I think Mr. Sandford's remarks are pretty nearly correct. I have had something to do with private separators, and I have sent my cream, as a rule, to the factory, and I have also sent the milk to the factory. If you condemn the private separator you condemn the whole of the country; you banish those who are not near a factory. There is nothing to show at present that the private separator is going to do anything that will be detrimental to the butter market. I am glad, also, that Mr. Sandford referred to the feeding of calves. When I was dealing with the factory in the summer we had to chop the milk up before the calves would use it—(laughter)—and it did them no good. If we had had a private separator we would have been able to rear good calves. Any milk carted from a factory in the summer is absolutely useless to calves. You might as well feed them on soapsuds. We have nothing to show in the prices for the best factory prints and the best lots from the private separator that the private separator is detrimental to the factory. One man said the private separator will ruin the factory. I fail to see that, unless the private separator is going to get a better price than the factory, and that is not likely. How is it to be done?

A MEMBER : The butter is not uniform in quality.

Mr. GUM : Where we are living, a distance from a factory, the private separator is the best thing.

Mr. T. H. PROSSER (Woolundunga) : I make from 100lbs. to 300lbs. of butter a week. I find in sending butter down it depreciates so in quality, but I have sent cream to the factory, and in warm weather have received the highest price for it. I have known others doing the same thing ; and while we are so far from the factories as we are, scattered in the North, the factories cannot be closed altogether. I had the privilege of going through Mr. Tuckwell's factory, and found they were making between 400lbs. and 500lbs. a week. I would like to know how a factory is going to be run profitably when it makes only this amount of butter, and only runs for a portion of the year. Much of the produce is made there and sent down to Adelaide to be sold.

Mr. W. GREEN : There is no question that in districts where there is no factory there is nothing else to do but to send the cream to Adelaide. That is a settled question. I consider that the private separator is the salvation of the farmer.

Mr. G. S. THOMSON, the Government Dairy Expert, who was called by the Chairman, said : We have had a very interesting paper read by Mr. Campbell, and written by Mr. Davidson, and also an interesting address by Mr. Sandford. I am sure you will agree with me that the hand separator has done an enormous amount of good, and that it has increased the output of butter in this State. But in some way the hand separator has done harm.

A DELEGATE : No.

Mr. THOMSON : I think it has.

A DELEGATE : You are mistaken.

Mr. THOMSON : It has done harm in this way : It has reduced the quality of butter.

Hon. A. W. SANDFORD : No.

Mr. THOMSON : I have travelled throughout the whole of the State. I am in a position to say that the hand separator is to be found in many districts where it should not be, and in the hands of farmers who ought not to have them at all. The separator is in the right place when it is in the hands of careful manipulators and does good, but to-day we find it in the hands of incompetent men. Many separators are working on farms situated in close proximity to a factory, and we find farmers send their cream to Adelaide when there is a factory beside their own door. Sometimes they send the cream a distance of 200 or 300 miles, and that means that by the time it reaches Adelaide it has considerably deteriorated. I learn that most of the second-class butter manufactured is made from cream separated by the dairymen, and that invariably the best butter is made from milk separated at the factory.

A DELEGATE : No, on the farm.

Mr. THOMSON : The contrary is the case.

Several DELEGATES : No.

Mr. THOMSON : Well, I am very sorry to have to differ with you on that point.

A DELEGATE : None of us agree with you.

Mr. THOMSON : I say again that the hand separator has come into the hands of farmers throughout the State who have no right to the machines. They do not manipulate the machines properly. Some treat their machines skilfully, but others again do not, and the result has been a reduction in the quality of the article produced. In its right place—in proper hands and in proper districts—the separator stimulates the industry. The hand separator wants skilled attention, and unless it gets that its use is to be deplored.

Mr. C. J. TUCKWELL, who was called on by the Chairman, said : You have

taken me by surprise. I am not a member of the Bureau, but this is a question in which I feel great interest. I may say I listened to the paper with much interest. As regards cream ripening in transit, I would like to point out to Mr. Sandford that in hot weather cream received at night by next morning nearly attains the percentage of acidity which is necessary for churning. Cream separated on the farm must necessarily get to a higher percentage before it gets to Adelaide. Frequently farmers send their cream in only once a week, and the butter is put on the Broken Hill market. I believe the people there are not so particular as to quality; they do not draw such fine distinctions as in Adelaide. Without casting reflections on Adelaide firms, I would say this—when butter is scarce, as it usually is in January, small lots from the country factories are not sufficient for the requirements of different people who are buyers in the Adelaide market, and if they know there is a good large supply from a central factory of which they know the quality, it is quite likely they would give a trifle more for the security of the supply than by buying up small lots, though they might get better quality. We know there are cool chambers on the railways. I am not too pleased with the way the railways handle the butter; and I presume, also, there is trouble with the cream, for butter with moderate care will not deteriorate to the same extent as cream will. As to private separators, factories cannot be established so that every farmer will be able to send his milk to them. The private separator is a necessity in certain parts of South Australia, but I maintain that you cannot make so good an article from the cream separated on the farm as you can from the milk supplied to the factory. As regards milk being delivered twice a day, does anyone know how many factories there are in South Australia where that is done? (A member: None.) As regards the quality of butter made from factories, Mr. Thomson can tell us; but it is not practicable to do without the separator where farms are a long distance from the factory, and where the quantities of milk are not large. A great number of the suppliers are small suppliers.

Mr. J. W. DALL (Nantawarra): I would like to speak in defence of the hand separator from a point not spoken of as yet. Most of the speakers have presumed that the cream has all to be churned at the factory. A great many churn their own cream, and they find considerable advantage in doing so, because the local township has to be supplied. I have known cream to go to Adelaide from our district and be churned and returned back in butter. It seems to me that the factories exist for the people and not the people for the factories. We want, as farmers, to make the very best of all that we have, and, speaking from experience, I certainly say that the hand separator has been of great benefit to me and to many others. The practice we have adopted is to churn our butter while the weather is fairly cool. We do not think it necessary that we should send our cream to Adelaide to be churned for us, and then have it sent back to our local storekeepers. We take that advantage ourselves, but when the weather becomes hot and there is a difficulty in making butter, as every farmer in this room knows, then we adopt the plan of forwarding the cream to Adelaide. We send twice a week when we have an amount that is worth sending, but when the amount is small we try to churn once and send the remainder to Adelaide; and I might say that during this warm period of the year we invariably get sufficient for our butter, in addition to the local price, to pay for the transit, and we generally have to send it twelve miles by the mail coach to the station, and then to Adelaide. I think that is an argument in favor of the separator. As has been said, the people of a very great part of the North cannot send their milk to the factories for the simple reason that there are no factories. I do not think we have a factory within twenty miles of us, and my case is not an isolated one. The hand separator has its place, and must have its place; and the more the farmers in the isolated places adopt this principle the better it will be for us all round.

Mr. J. C. SYMONS (Crystal Brook): I think the hand separator and the factory have been put in opposition when they have no need to be. I think that point of Mr. Sandford's is a good one—that they are not rivals at all. In the dry North factories cannot be carried on profitably, and I do say, and know from experience, that the hand separator has been the salvation of hundreds of farmers. I am not a farmer, but I sell flour, bran, and pollard. A man who has a very small farm brought in a load of wheat, and I said, "What will you do to live?" He replied, "Oh, I have eight cows, and I have a separator, and I send my cream to the Jamestown factory, and we are getting £2 15s. to £3 a week, and are doing well." That is a type of the men in the North.

Mr. W. JAMIESON, M.P. (Gumeracha): It is not a matter of separators *versus* factories, but separators and factories. One gentleman put the thing in a nutshell when he said private separators were the next best thing to factories. I am surprised that Mr. Sandford spoke so strongly in favor of separators, because I remember him saying factories were the thing.

Hon. A. W. SANDFORD: That is so. First, factories.

Mr. JAMIESON: I think that gentleman put it right, if factories can only exist and agree to work with the separators. We know that farmers are generally individualistic. They are confined to their own homes, and do not co-operate as others do; hence the downfall of factories. They do not even take one another's milk along the same road. Mr. Sandford offered a good suggestion of giving a bonus to those who supplied milk all the year round to a factory. With regard to the question of skim milk for calves, it comes to us more forcibly than ever before, seeing the depleted state of our stock, but at one time it was thought little of. Skim milk of any kind is not the best thing to rear calves on. I think it would be advisable to go in more for co-operation, and have salesmen to sell our milk. I should like to see the question discussed. I think by co-operation we would bring about the best quality in our articles, and so secure the best prices, either in the home market or for export.

Mr. H. B. WELCH (Port Elliot): We have tried it for about seven years, and we find co-operation very successful. The fault I have found with the hand separator is that when the cream is sent to the central factory they do not get so much butter as we get at home.

Hon. A. W. SANDFORD: That is quite true.

Mr. WELCH: Well, that is a point I would like cleared up. I have tested the question for a considerable time, and I speak from my own experience. Of course, I am aware that the cream may deteriorate in transit, but I am doubtful whether it makes all the difference. If everybody had proper places in which to keep their cream, so much the better. Then the quality of the butter is good, otherwise it must be far from that. That is an important point. I think there should be co-operation, and that if farmers work together more the results will be all the more successful.

Mr. CAMPBELL: I do not think Mr. Sandford took a fair illustration in instancing January. Then the factories are not working up to anything like their full capacity. I think more has been said in support of the paper than in opposition. I only regret that the writer of the paper is not here himself, because he could then have explained some of the statements he made. I think he would have made things pretty lively.

Hon. A. W. SANDFORD: Mr. Thomson has not observed the real advantage of the separator. It is this: The people who use the hand separator used to make butter by the old pan system, and made very inferior butter, whereas by the separator they make a much superior article. If the cream is sent to Adelaide there is a better chance of making higher grade butter than when milk has been jumbled along in a cart for five, six, or eight miles. The ideal condition for making the finest quality of butter is to separate the milk as

quickly as you can on the farm. In sending cream to the city, although it will carry better than butter, a considerable proportion of it must be over-ripe, that is, showing more acid than it ought to; and in that case you cannot get as much butter from it as if you had got it at the right moment.

The Necessity of Dairy Inspection.

Mr. W. RABACH, manager of the Onkaparinga Butter and Cheese Factory, read the following paper on "The Necessity of Dairy Inspection":—

In bringing the subject before this meeting I am sure you are aware of the importance of the dairying industry to South Australia. Although much has been done by the Government, by appointing a dairy expert and dairy inspector—and I hope you all will admit that both officers have done good service—still it cannot be denied that there is yet more room for the improvement of dairies and dairy herds. More should be done to increase the quantity and improve the quality of the milk; more attention should be paid to the sanitary condition of the dairies, milking-sheds, and surroundings, and as the latter especially is responsible for thousands of gallons of milk getting wasted every year, and as the raw material greatly affects the manufactured article, it is plainly seen that this is a very serious matter to milk producers. If a proper system of Government dairy inspection could be adopted it would do away with a lot of loss and hardship; the result would be a more uniform and higher class of dairy produce, and consequently a better price for it, which would be a great benefit to all concerned. It may be said "Why have Government dairy inspection; why cannot we do it ourselves?" Of course it could be done; there is any amount of means and appliances on any farm to keep the milk, even in the hottest time of the year, in good condition for a reasonable time at least, but it is in the most cases not done, and never will be done unless the parties at fault are compelled. On large farms where dairying is carried on extensively the owner is generally a born dairyman; every care and attention is paid to the milk, the cows are well treated and looked after, and very little fault can be found, but the trouble is mostly with small or mixed farmers who consider dairying only as a branch line of income, where milking-shed, fowl house, and pig sties are combined; and in the summer, when most care is required for the milk all hands are employed harvesting, and milking is done by children, or perhaps in a sort of a way very late at night by adults. It would not matter much if these people made their own cheese or butter and disposed of it for what they could get (I am sure it would not be very much). The great injustice is done when such milk is delivered at the factory or creamery, where this inferior milk is mixed with good milk, and no difference is made in the amount to be paid. It is not to be wondered at if some people say "What is the use of being careful and particular? My neighbor does not go to any trouble, and he is just as well off." For this reason advice should be given how the necessary care is and must be taken with the milk; how to keep cows, and of suitable breed. Some competent person or persons should be appointed with power to compel, where necessary, that it is done—advice only in that direction is useless unless acted upon. I would not for a moment agree to appoint half a dozen inspectors to overrun the country to show their authority, but have one or two men who can consider the circumstances each farmer lives in, and according to that draw a line to make arrangement as to the cheapest possible way to effect the intended reform. So far the various boards of health, the district councils, the factories most interested, and creameries have attempted to bring about an improvement on existing conditions, but the result has (for some reason or the other in most cases) been a total failure. In consequence of this the Governments of America, Denmark, Germany, New Zealand, and Victoria all have in turn been forced to make dairy inspection compulsory, with the aim of not only maintaining the standard quality of their cheese or butter, but to improve it, so as to be able to compete with the best makers for the best markets in the world. The above countries have almost compulsorily educated, assisted, inspected, and actually supervised the whole industry with great success; and I am convinced, unless the Government of South Australia adopt a similar course, the advance of the dairying industry here will be very slow.

Mr. G. S. THOMSON (Dairy Instructor), who was called on, said: We have again here a very interesting paper. I think Mr. Rabach is in a position to speak with regard to this subject of dairy inspection. At least he is the manager of one of our largest cheese factories, and he accordingly receives a very large quantity of milk daily. He will be able to tell you, in his examination of the morning supplies of milk for cheese-making, if he finds large pieces of dirt, cobwebs, flies, &c. Allowing these conditions to exist, is it possible

for a factory manager to manufacture a good quality of either butter or cheese? The milk is contaminated before it reaches the factory, and that contamination is brought about by the neglect of the supplier. Until we have a good inspection in our State we will not maintain our good name as a butter and cheese producer. Mr. Rabach has stated that in America and New Zealand they have a good rigid inspection. In New Zealand farmers are compelled to aerate their milk before it is sent out from the farm. No doubt that is rigid, but if farmers would keep dirt out of their milk I have no doubt the quality of our produce would be higher than it is at present. This would help the hand separator. A lot of our cream reaches the factory in a contaminated state, because it is kept in an atmosphere of smell and taint. The milk takes in the taint, and consequently is damaged. I would like to hear the opinions of members on this.

The CHAIRMAN: Has Mr. Rabach got power in his own hands to refuse to take milk from the supplier?

Mr. RABACH: Yes; but sometimes you cannot decide it. It will not be bad enough to refuse and yet not good enough to be accepted.

The GENERAL SECRETARY: What would Mr. Rabach do if a director sent in bad milk?

Mr. RABACH: If the milk were bad it would not be received.

Mr. J. B. ROWE (Quorn): My aim in getting up is to condemn this proposal for an inspector. We have quite enough inspectors and instructors already. We have quite a sufficient sum paid for the inspectors we have at present; and, to pay a compliment to those at present employed, I will say I think they are a capable staff of men, sufficient to cope with all the wants of dairies, creameries, and factories in this State. Another thing I object to, as being a South Australian born, is in being too harshly dealt with in my liberty as a subject of this State. We have too much of this growing on us daily, and I am inclined to flinch under it a little.

Mr. BOATH (Chief Inspector of Dairies) said: Since I took up the position of inspector I have inspected a number of dairies, and in parts I found some of them really shocking. In places the sheds where the cows are milked there is very little ventilation and the absence of proper facilities. All cows should have proper shelter, and there should be provision for attention to cows after calving. In one place I noticed that where a cow was milked there were located close by pigs and poultry. Is it possible to send pure milk to the factory when these are the surroundings? Everyone who keeps cows should provide suitable sheds with a bail for each cow and proper appliances for milking. I have inspected the dairies in Onkaparinga, Strathalbyn, and Port Elliot, and all I can say is that some of the proprietors of the yards ought to be ashamed of themselves.

A DELEGATE: There are plenty worse.

Mr. BOATH: Very few. It certainly has impressed me that inspection is absolutely necessary in order that some degree of cleanliness might be observed; in fact, I think all cowkeepers should be licensed. The regulation under the Health Act gives power to local boards of health. Inspection is really necessary if the farmers are going to produce a good article in the way of dairy produce. It should be our aim to do this, and it can only be done by a good system—a system of cleanliness and proper attention to details.

Mr. BROWN (Port Elliot): The paper read by Mr. Rabach seemed to me to advocate inspection of dairies. I have seen some of the best dairies in the Port Elliot district. Personally, I do not believe in an inspector, as I think the manager of the factory is the best man to do that. He is a good deal better than the inspector, and is in a better position to see things. He would be the best inspector, and would cost less. The inspector has made certain remarks about the dairies at Port Elliot, but I think the Port Elliot factory has secured

the highest prices ever since it started. That is rather against what the inspector has said. If the dairies are in such a bad condition it is very strange that we can get the best prices.

THE GENERAL SECRETARY : Ever since I have been in the Bureau I have advocated dairy inspection, because I hold it is a great necessity. There are many dirty people engaged in dairying who will not observe the ordinary rules of cleanliness unless compelled.

MR. W. G. CLOUGH (Mylor) : I am extremely sorry that such remarks have been made about the dairy people. Anybody would think they were the dirtiest people in the world. I do not think the remarks are deserved. From the talk about regulations and the necessity for inspection anybody would think that dairymen are the dirtiest people possible. I am surprised at the remarks made, because the dairy people do their duty as well as other people.

MR. J. W. DALL : The inspector has said that there should be a certain class of shed, and he referred to the conditions under which some people milk. He used as an illustration the fact that some people milked their cows in the open air. I contend that there could not be a better place.

MR. WELCH (Port Elliot) : I am in favor of cleanliness, and I will ask the inspector does he know a case of fever on any farm?

INSPECTOR BOATH : Yes.

MR. WELCH : How many?

INSPECTOR BOATH : Very often. In the Strathalbyn district there was a case, and the cattle had to be removed from the farm. The person had about sixteen cows.

A MEMBER : Name the place.

INSPECTOR BOATH : I do not want to name the place. The cows were removed from the farm to another place for about eight weeks, until the people got better. The same man was a member of the district council. There are several others I have met; and that is what I deprecate—that the women should have to go amongst this filth. In other districts I have had equal cause to complain, while some of the factories are not so clean as they should be.

MR. R. CAMPBELL (Millicent) : People are often careless in respect to this matter, and it was necessary to have competent inspectors.

MR. C. J. TUCKWELL (Wilmington) : This has been brought before the Dairy Board. Glaring cases have been brought forward, and I believe they are true, though far from common. They have been brought forward to show the necessity for inspection. Inspection could be done in two or three different ways. Some say let the local inspectors do it. Then another thing has been said. It is suggested that the managers of the factories could carry out the inspection. Anyone who has had anything to do with factories and suppliers knows it would not be in the interests of dairying for the managers of the factories to do it. If the manager had occasion to speak to a man about the condition of his dairy the first thing the man would do would be to get a private separator; and it would injure the factory, because the more suppliers there are the better. The local inspector under the board of health is generally a harmless kind of man. We cannot look to them. There would be some expense in the matter. As regards the present staff, it is not competent to deal with the quantity of work that would have to be done. In Mr. Thomson we have a man with a scientific education, who can train the butterworkers in their work, and his services can be used in a higher way than in an inspection of dairies. The only way to overcome the difficulty is for the Government to appoint a couple of dairy inspectors to go round the country; not to sit on people, but to show them what to do.

MR. W. JAMIESON, M.P. (Gumeracha) : I deprecate the remarks that have been made about dirty dairies. I am in favor of cleanliness as much as anyone.

There has been an illustration given that if you get twenty shillings change for a sovereign and one of them happens to be counterfeit, you do not throw away the other nineteen. We are apt to be branded all alike because a few are not clean. I hope we shall not have more inspectors, but that those we have appointed will be asked to do their duty. We pay a health rate for keeping a health inspector, and we pay a doctor too, and some of our districts are not very large; and with the staff we have at present, and with the power in the hands of the factories and inspectors it is quite enough without going to more expense. I hope there will be no other inspection, but that those in power will be asked and compelled to do their duty.

Mr. A. L. McEWIN (Brinkworth): I agree that too much has been made of the cases given. I have been brought up in a dairy where we had up to forty cows, and I am a specimen of the family. We never had an ailment except measles. I was brought up in a wet district beyond Golden Grove. The rainfall is not what it used to be.

A MEMBER: They have cut the trees down. (Laughter.)

Mr. McEWIN: The trees have become so thick that we have had to ring them. I think we have enough inspection at present. On how many farms are diseases known? Go round the dairy farms and you will find the healthiest class in the country. I think we have all the inspection required. These remarks that have been passed refer to one in a hundred. Self-preservation is the first law of nature. I travel about the country, and it is a pleasure to go into ninety-nine dairies out of a hundred.

Mr. D. F. KENNEDY (Kadina): I do not think it is necessary to have an inspection of dairies. I think the dairies to-day are much more cleanly kept than they were many years ago. In this direction the Bureau has done considerable good, because by meeting together from time to time the farmers learn methods as to the proper keeping of dairies. I am prepared to admit that there is necessity for close attention and careful work in connection with the dairies. For instance, if there is a smell about a dairy nothing will take it up quicker than milk. But the position is this: An inspector could not carry out the duties thoroughly for the simple reason that he could not be in every yard, and he could not be there at every milking hour. It is a matter of impossibility, and therefore the work could not be thoroughly carried out. On some days it is impossible to keep dirt out of the milk; but there is no harm so long as it is strained immediately afterwards.

Mr. W. CORNISH (Gumeracha): All I can say is that I have kept a dairy for forty years. I have never had fever in the house.

Mr. J. C. SYMONS (Crystal Brook): There has been a great deal of discussion over this question, and there is such a diversity of feeling that, in order to test the opinion of the Congress, I will move—"That, in the opinion of this Congress, the Government should appoint a dairy inspector."

Mr. H. F. HOLZGREFE (Millicent): I second the motion. I say, and my remarks do not apply to the general body of dairymen, that there are many—several at any rate—not in as clean a state as they should be. Of course, I hold that the great majority are clean, but we should remember this: that one or two dirty dairies which supply the factories with milk endanger the rest of the milk, and consequently a little bad will affect the quality of many hundred gallons. For that reason I think that for these people who will not keep their places clean there should be an inspector to make them do it.

Mr. ROWE: Then I will move as an amendment—"That this Congress is satisfied with the present system of inspection."

Mr. E. COPLEY (Orroroo): The motion, in my opinion, is not necessary. The local boards of health have the necessary machinery. I think the Congress is very much mixed. I advise all the delegates to vote for the amendment, for

the reason that sufficient inspection is provided for in the regulations in the hands of the local boards of health. There is no necessity for any more Government inspectors. Let the officers of the local boards carry out their duty. If they do that then that is sufficient.

The motion was put and lost, and the amendment—"That this Congress is satisfied with the present system of inspection"—was carried by a large majority.

WEDNESDAY AFTERNOON SESSION.

Plant Food.

Mr. MOLINEUX read the following paper, prepared by Mr. J. H. Snell, of Angaston Branch:—

Plants require food. They take it dissolved in water, and must have a supply of water to enable them to obtain it. The first source of food is the seed, the second the soil, and the third the air. If we plant some wheat on wadding and supply it with water only we find it grows for a time until the outside skins only of the wheat grains are left, showing the first source of supply—the seed—is exhausted. If we now remove the plant to the soil it will continue growing, drawing its food from its second and third sources—the soil and the air. The food that is ready in the soil is called active, while that not ready for use is called dormant. The dormant may be made active by cultivation. When we consider that all the substance of a plant or tree must have come from the soil or the air we begin to wonder that the plant food lasts as long as it does. Of course it is being constantly renewed, but this natural renewal is not sufficient in our fields and gardens. In nature it is enough, but less goes back in our cultivated lands, and more is required from the soil. By cultivation we open up the soil to the air, and this helps to make dormant food active. We also remove weeds, which would take some of the plant food away. Then the roots spread more easily in the soil if it is cultivated, and we know how far some roots go for their food. If the soil is hard and tough some of the roots cannot get through, and the tree will grow slowly, or become weakly and produce an unhealthy fruit. We may naturally infer that it is with plants as it is with us. If we are badly nourished and weakly we are more liable to disease than if we were strong and healthy, so how important it becomes to see that our trees are healthy as far as we can make them so. If the roots are searching through a hard soil for the particular kind of food they want the plant is kept waiting. If a plant or tree looks sickly there is something wrong, and we should try to find out what it is, and endeavor to remedy it. Perhaps if we knew more of what is in the tree, and also what is in the soil, we should have a better idea of what the tree wants, and perhaps be able to supply it. We know there is carbon in the tree, and some of this is supplied from the air, the leaves of the tree having the power to absorb the carbonic acid gas in the sunlight, retaining the carbon and giving off the oxygen. In the tree there is also phosphorus, nitrogen, &c., and where these are deficient in the soil they may be supplied by phosphates and nitrates. We might say there is sugar in the fruit, and we cannot supply that; but if we pour some sulphuric acid on sugar we find that one of its chief elements is carbon.

If the ground is wet and cold trees will not do well, and drainage is needed. If they are too crowded the air and sunlight cannot get at them, and experience has told the right distance to plant certain trees, and this is one of the reasons they require such a space. Mr. Salter told us in his paper on "Fruit-growing in Tasmania" that in that State they prune the trees in such a way that they allow more sunlight to get at them than we would venture to do here.

Gardeners get better crops than farmers in proportion to the land tilled because the work is more perfectly done—the land is more thoroughly worked and better manured. But it is no good doing a great deal of work and after all have a bad sort of plant or tree growing. This is equally true of wheat or fruit trees, and this has been emphasised lately in this Bureau, and some members have decided to get rid of poor varieties of trees and plant more payable ones.

But in gardens, as in farm lands, the soil becomes exhausted. The wheat or the fruit trees are continually drawing the same kind of foods from the soil year after year, and it stands to reason that the supply will not last for ever if not renewed; so I believe it will pay to experiment with artificial manures for fruit trees and vines, the same as it does for wheat. How are we to learn all about this? Well, partly by the means taken at the Agricultural College, where chemistry and analyses of soil are taught, as well as the practical part of farming. And I think if our gardeners have some idea of the properties of the soils in their gardens they will be nearer the knowledge of how to treat their trees. Of course much is learned by observation and experience, and I do not decry these in the least; but the gardener who can tell more

about the soil and the plant food it contains than simply that it is clayey, or sandy, or a black loam, &c., has a better chance of being successful. I fancy that at times when we say such and such a tree is not suitable for that locality it is sometimes possible to have made it a success if we had applied the required plant food.

Plants require different kinds of foods. Potash, carbon, phosphorus, sulphur, chlorine, sodium, lime, silica, alumina, and magnesia are among them, but if given pure they would destroy life. Part of the carbon necessary is got from the carbonic acid gas present in the air. This gas is absorbed by the leaves in sunlight; hence the necessity of allowing room between the trees for the sunshine to gain admittance. Very little of the work that is going on is seen by us, and we are apt to forget that it is proceeding all the time; whereas, if we give some thought to the matter, perhaps we may assist nature sometimes, and be the gainers ourselves. Carbonic acid gas is formed when any vegetable matter is burnt, and is also given off with our breath, so there is a constant and abundant supply. Sulphur is supplied in sulphides and sulphates, carbon in carbonates, and phosphorus in phosphates. Salt is made up of chlorine and sodium, both of which are plant foods, and silica and alumina are found in white clay, which is silicate of alumina. Silica is needed especially by plants having a white straw, such as wheat, barley, and oats. Red clay has iron in it, and iron is a plant food: hence the value of ironstone land for gardens.

A seed consists of two parts—the germ, or true seed, and the food that is to feed that germ. The food is at first very dry, because it had to be kept, but water is required to dissolve the food, and germination commences. Then a steady supply of water is necessary to give proper growth. When we have a good rainfall the water seems to sink quite away into the ground, but in many cases it comes up again by capillary attraction. Air also is required, for even if water were supplied and air excluded there would be no growth. Air can pass through soils if they are loose, but not freely through hard-caked soils; hence the necessity for cultivation. If a seed is covered all round with clay it cannot get the air and cannot grow. Something the same happens with roots that are in clay, and the soil requires to be made loose and open. It is chiefly the oxygen of the air the plants want.

To obtain a proper knowledge of the constituents of the soil it needs to be analysed. The following are found by analysis to be in hay:—Potash, soda, magnesia, lime, phosphoric acid, sulphuric acid, silica, iron, salt. The analysis of a grain of wheat shows all of the same substances found in the hay. If we keep on growing crops which require a particular plant food in large quantities, *e.g.*, phosphoric acid, we find the crops getting smaller and smaller, owing to the small supply of this one food. With cereals we give the land a rest, and thus fresh plant food is brought into an active condition; and it is also done by change of crop, which does not make such a call on the food which the other plant has almost exhausted. Although sometimes we can say a crop looks sickly we cannot tell what it requires, but as we obtain more knowledge by analyses of crops and soils we will be getting nearer the knowledge. Our wheat lands are given a rest, and we find in our gardens the trees give themselves a rest by bearing a good crop only once in two or in three years.

Now, as the garden-er cannot give the land a rest he must endeavor to supply in manures the food his trees are making such calls on, and if he can find out which food this is and which manure contains it he has made a long step in the right direction. If a wheat crop is stripped and the stubble burnt some of the same substance which was taken out is returned to the soil, and with hay crops less is returned. In gardens the leaves fall and return some of the plant food, but what is taken away in the fruit and the cuts will need to be supplied some time—if not in our time then in the time of our descendants—if the same kind of tree is planted when the old ones are removed.

Lime is very useful in turning dormant food into active, and active tillage generally so enriches the land by breaking it into small pieces and letting the air into it that it becomes more capable of yielding a complete supply of food. Rain and frost also help the gases in the air to make plant food in the soil. If you never noticed how much change is made by frost and rain let a large piece of clay be placed on a flat stone before winter. The first frost will make it as hard as a stone, but after a time it will thaw, and you will see it covered with a nice open earth.

Stagnant water, that is, water which does not move about the land, prevents air from getting to the roots, and the growth is not good. Of course, a system of drainage is required where water gathers and does harm in this way.

Ammonia is one of the plant foods required, and as air passes through the soil it is robbed of all its ammonia, which is retained as plant food. Ammonia is also supplied by farmyard manure. One of the reasons for farmyard manure being so generally useful upon land may be traced to the fact, in farms at least, that we are thus returning to the soil one portion of that which had been grown upon the land. The bones of an animal's body are built up of substances drawn from the soil by plants. If plants could grow upon the land, and, when they had performed their duties, they could return to the soil all the material they had drawn from the ground there would be no exhaustion of the soil. Much of the plants is eaten by animals, who add some of it to their bodies, and thus the land loses materials which are used

for making bones in the live stock. This is one of the reasons why bonedust is such a useful manure, for it repays a portion of the loan which had been borrowed from the soil. The analysis of bones shows the presence of organic matter, phosphoric acid, carbonic acid, lime, magnesia, soda, and potash. Mineral phosphates contain phosphoric acid and lime, and so far as supplying these two substances these phosphates take the place of bonedust.

No farmer or gardener can hope to be successful without local experience, but it is still an advantage to a practical man if he knows to some degree why his practice has been successful and why in some cases he has failed. The principles of agriculture do not teach the business of farming or gardening, but it adds to the interest and helps a man taking up new land or going to a new district to farm or work another soil with a better knowledge of the changes of management necessary.

Mr. T. A. WILSON (Port Pirie) said: The paper was an interesting one. One point I wish to make is that of the unreliability of the analysis of the soil. There has been, perhaps, more stress made upon that point in the paper than there has been upon experiments. Although I would not depreciate the value of such analysis, yet I think it is not so reliable as where a man experiments for himself in his own district.

Mr. W. R. WHITTAKER (Port Broughton): Reference has been made in the paper about the burning of stubble. My advice is burn the stubble. In a great many Branches of the Bureau this has been tested, and it has been found that returning the stubble to the ground after burning is the best way.

The CHAIRMAN: I will answer the question from my own point of view. My opinion is that you should not burn your stubble, but turn it in. If you have sufficient dung there is no necessity for it in that case; otherwise if you merely use artificial manures, I am sure that the best way will be to turn in the stubble and not burn it.

Mr. JORGENSEN (Mount Remarkable): As far as the use of the stubble goes I may say that I have found that where we had a crop of hay we always got a better crop next year than would have been the case if we had left the crop for wheat. Year after year where hay was cut we always got a better crop.

Mr. J. DAVEY (Yorketown): In the old times we used to burn the stubble. It then settled as a fertiliser and destroyed a lot of insect life. In a dry climate if you turn the stubble in there is not enough moisture to rot it, and it might lay for three years before disappearing. Very often where it is buried in the stubble is turned up in the following year. If that difficulty could be got over there is no doubt that burying it in would be preferable to burning.

Mr. A. GOODALL (Paskeville): I would advocate the burning of the stubble because I have found it beneficial to the crops. I do not really think there is much in ploughing it in. In the greater part of the State the stubble would not decay.

Mr. A. L. McEWIN: I think the paper is an excellent one, and I agree with the main point right through. The paper is well worthy of the closest consideration by farmers and gardeners, especially the remarks about the application of proper plant food. Experiments with superphosphates have proved their value and importance, and I have seen evidences of the effect they have had on the soil, and indirectly on the plant. Not only are the crops earlier, but the results have been really wonderful. I know of cases where the use of the manures has produced extraordinary results. There is no doubt that we have to go in for the cultivation of the soil for the sake of retaining the moisture and adding the plant food. As the paper said, in gardens as in farm lands the soil becomes exhausted, and it becomes necessary to renew the supply by the use of artificial manures for fruit trees and vines in the same way as we do with wheat. I know of a gardener who experimented with superphosphates on some vines. I sampled some of the grapes, and they were beautiful. The grapes matured fully a month earlier with the treatment. That gentleman had one of the best crops of grapes I have ever seen in my life, and I have seen some good crops at different times.

Mr. GUM (Amyton) said: It is a good many years now since we had any stubble to deal with in the district in which I live.

A DELEGATE: That's a bad job.

Mr. GUM: I have always found that where the stubble is burnt you always get a better crop than on the land where the stubble had been ploughed in. I believe that where the stubble is burnt the fire conforms it into food necessary for the growth of the plant, but in its raw state I believe it does not possess that quality necessary to the growth of the plant. More than that, as somebody has already said, the stubble keeps the soil lying very open, and allows the food which is in the soil and the food that is necessary for the growth of the plant to escape. Some of us have tried ploughing our stubble, in order to make manure, but if it remained there for twenty years it would not make manure. In dry country the stubble would not rot.

Mr. ROWE (Quorn): Supposing you burnt your stubble on a day similar to last Saturday, when the weather was so boisterous and the dust so terrific that it was impossible to see any distance in front of you, what would become of the ashes? Your neighbors would probably get the benefit of your work. Supposing you had burnt it in the morning, how much of the ashes would you have been able to retain?

The CHAIRMAN: There is another matter that I believe is of importance in the consideration of this question. By ploughing the stubble in you return plant food and humus to the soil that is very much required. Therefore, wherever it is possible to do so, wherever you can make the stubble rot, you ought to plough it in. Take stinkwort for instance.

A DELEGATE: Do not mention that.

The CHAIRMAN: It shows that the ploughing in of straw or of vegetable matter restores to the land properties that are necessary to the proper growth of the plant. Stinkwort was growing very thick about Hahndorf, and one farmer went to the expense of having some boys and girls to pull the stinkwort up. They found it slow work. Subsequently the plough was got to work, and the weed was ploughed in. As a result the land where it was ploughed in returned 6bush. more to the acre than where the stinkwort was removed. That is very practical evidence I think of the value of ploughing in. Hahndorf is a place where they get a very heavy rainfall, and consequently the stinkwort properly rotted. Wherever you can look with certainty to the stubble rotting quickly you ought not to burn it because of the food that vegetable matter contains for the plant.

Mr. W. E. FISHER (Tatiara) said: A man with practical experience told me that bonedust has in it what the land requires. A good deal has been said about superphosphates, but any gardener with a lot of experience in the hills will tell us to-day that there is nothing like bonedust for trees and vines. The writer in the paper evidently thinks the same, for he says that bonedust is a useful manure. I have used both, and I strongly advocate bonedust; and I think the farmers should use bonedust more than they do.

Mr. E. M. SAGE (Balaklava): I find that the use of bonedust in dry districts is too slow. The superphosphate, of course, is water soluble, but bonedust is not. In dry country it pays farmers to use superphosphate in place of bonedust, because there we should use the most soluble manures you can get. If the trees are suffering do not put on merely 1cwt. of manure. Put on 5cwt. or 6cwt.; it will not hurt them.

Mr. D. F. KENNEDY (Kadina) said: This discussion is a bit mixed. It is going off into a variety of subjects—on the burning of the stubble, use of manures, and talk about trees. It is not possible to get any information in a discussion of this kind. We came here to get information, but if this keeps on we are not likely to get it. I did not like the paper, for the reason that the

writer rambled too much in his statements, and touched on matters that had no bearing on the subject. I think myself it would be far better to confine our remarks to just one subject, so that it could be dealt with properly. I think the subject of the analysis of the soil is the most important work, and one that we should know something about. We want to know what the soil contains, because, as the paper said, that if we had some idea of the properties of the soils we would know better what treatment to apply to plants. To-day more attention is being paid to technical farming than was the case in the past. We old farmers never had the privileges that the young farmers are having to-day, nor the opportunities to gain knowledge on subjects of vital importance to us. To-day there are men who can give us the benefit of close study and attention to the subject.

MR. H. A. DAVIS (Riverton) said: I am quite convinced that the use of fertilisers has been of great value, and has resulted in great success in production of wheat crops as well as to gardens and trees. There is no doubt that a garden to be properly and successfully conducted must be treated with fertilisers for fruit, grape-growing, &c. With regard to question as to whether the stubble should be ploughed in or burnt. I think a great deal of practical experience is needed to discuss it. It depends greatly on the sort of land that the farmer has. In a dry district I think it is better to burn the stubble, because in doing so a large quantity of insects are destroyed, and so are seeds of weeds. If the stubble is ploughed in these weeds keep on increasing. If we have a wet district I think it is better to plough in the stubble, because there is a greater opportunity for it to rot. With stinkwort I think it is much better if we can plough it in.

MR. W. G. CLOUGH (Mylor) said: I agree with the writer of the paper that the first source of food is a seed, because the plant gets its first food out of the seed.

A DELEGATE: How do you know?

MR. CLOUGH: As the paper pointed out, if we plant some wheat on wadding and supply it with water only we find it grows for a time, until the outside skins only of the wheat grains are left, showing the first source of supply, the seed, is exhausted.

MR. SMITH (Hawker): It appears to me that the subject is too deep for any of us to discuss.

A DELEGATE: What are we here for? Are not we here to discuss such subjects?

MR. SMITH: I say that we have been criticising that which we do not understand.

THE GENERAL SECRETARY: I regret to say that there are many scientists here who really do not know what they are talking about. I am one of those who thoroughly believe in what has been said in the paper written by Mr. Snell. I am pleased to know that we have a gentleman in the Bureau who can write such a valuable paper. He is quite right. Plants must have certain kinds of food, and if any one of these is deficient the plant will pine away and die. Plants must have nitrogen, potash, carbon, and phosphoric acid. Analysis of the soil is important, but the best way to obtain knowledge concerning its constituents is by experiment. In regard to the burning of stubble I may say that for many years I have been against its being burnt. The stubble or plant grown upon the land consists of a great deal of organic matter. If you burn the straw in a paddock after stripping you send into the air 94 per cent. of the properties it contains. It is carried away from the land, and you lose the benefit of it. Your neighbors get the value of it, because it is carried by the wind on to their land. I say it is a great mistake to burn the stubble. It is a subject well worthy of consideration, and we should all read and study.

Suggestions for Increasing the Usefulness of the Bureau.

Mr. W. C. GRASHY gave an address on this subject. He said: I recognise that I have undertaken a delicate and difficult task, and nothing but deep conviction and a strong sense of duty as a member of this Bureau prompts me to go on. I am a member of the Bureau, and loyal to it as a whole and to my fellow-members individually without exception. I know what the Bureau has done, and there is not one man who values it more highly. I am prepared to stand by it should any enemy attack it from within or without; but as members it is our duty to examine ourselves, our work, our aims, and our means; to consider whether we are doing all we can, and, if not, devise means for increasing the usefulness of our work. To guard against criticism I would point out that we do not thereby condemn our past efforts.

I wish our attitude to-day to be that of men with kindly feelings, recognising all good, overlooking all faults; but I would point out that self-satisfaction leads to stagnation, while discontent is the first stage in progress—that is a discontent prompted by the highest motives. It will be necessary to briefly review our present position. The Bureau owes its existence to the idea of Mr. Molineux, and its success mainly to his efforts. It will ever be a monument to his services to this State. Its peculiar organisation is unlike anything else I have heard of, and I have probably studied this subject more than any man in South Australia, if not in Australia. It is capable of securing the greatest good with the least expense.

To outline its valuable work in the past would take more time than I have for the whole of my address. It has brought the thoughtful men and the practical progressive men together; it has stimulated the spirit of inquiry; it has made the theoretical man more practical, and the practical man more thoughtful; it has promoted experimental work; it has afforded means by which the ideas of men at wide distances apart have become aware of one another's existence and work; it has been the means by which special officers of the department and others have been able to reach the most progressive men, and stimulated them with new ideas; it has disseminated information; and it has in many ways directly and indirectly promoted the welfare of the State, increased the general intelligence, and advanced the rural industries. That is enough to excuse a feeling of "We have done very well; let us take our ease and admire ourselves." But let us beware when such a feeling comes upon us. It is then more than ever that our watchword must be "Onward."

WEAKNESSES.

The Bureau has weaknesses. Can a surgeon dress a wound without pain? Can I touch these weaknesses without offending? I hope so, for I am but one of the imperfections. Let us then kindly, gently, but firmly and quickly, examine where our weakness lies, for we must diagnose a complaint before we can prescribe a remedy.

1. The Central Bureau.—The Central Bureau should take the place in the Bureau system that the heart does in the circulatory system of the blood, but I am very much afraid that many country members think that the Bureau suffers from the drawback of a weak heart; and I believe Parliament is thereby influenced not to give us the money we should have. I find that for some years it has not been looked upon as a progressive, business-like body. Perhaps the idea is wrong, but people are influenced by erroneous beliefs as powerfully as by correct ones. It is certainly a defect that there is no provision in its organisation for rejuvenation.

2. The Branches.—These, I am afraid, also sometimes lack aim and system in their work. Meetings are held without definite purpose. There is not sufficient effort to secure outside information or stimulus to new work. Members sometimes go through a round of talk, and state opinions which may

be formed on partly erroneous foundations ; but, having no guide by which to test their correctness or otherwise, men are often confirmed in error instead of being taught the right. Some of the best men in the country have retired from membership or decline to join and take part in the work of the Bureau from the aimlessness of the meetings, or the too great tendency of men to talk who do not first impress their stamp on the district by their work. I know that cannot be altogether prevented, but the fact should be named in a discussion of this kind.

There is another and very serious defect in the work of the Branches which cannot fail to have a most serious detrimental effect on the future. It is the lack of interest shown by the young men—I mean the youths and young men from 17 to 25 years. The future of the State is in the hands of the young men ; but where are they in the Bureau meetings, in the Conferences, and in this Congress ? It is easy to say hard things about the young men, but it seems to me that it is useless blaming them because they are but exhibiting the results of their training, and the present condition of things does not reflect the greatest credit on those who have trained them. This is a question which should claim our most serious consideration, and we should endeavor to get at the root of the matter. I think Branches might well devote time to discussing it.

SUGGESTIONS FOR IMPROVEMENT.

1. The Central Bureau should be reconstructed.—It is a mistake to call any board into existence without making provision for its rejuvenation, which is a law of growth and progress. We recognise it in our Parliaments, and in all bodies intended to progress. I wish to deal with principles. I hope we all recognise that the present members have done splendid work. Men have a certain fund of originality, and when that is exhausted they repeat themselves. Now, a far-reaching organisation like this Bureau system requires a very strong, active, virile, progressive centre, ready to live in the future rather than on recollections of splendid performances in the past. We should provide for the regular accession of new blood, and for this purpose, and to avoid invidious distinction, my first suggestion is that the Central Bureau retire, and, that being supposed, I will suggest the following plan for reforming it :—The membership might consist of—(a) The present public servants, or their successors ; (b) eight members to be appointed by the Government on the recommendation of the public servant members sitting as a committee for the purpose ; (c) four members to be appointed to represent (1) the University, (2) the Agricultural Society, (3) the Vignerons' Association, and (4) the corn trade section of the Chamber of Commerce. One-third of members (b) and (c) should retire every year, but be eligible for reappointment. The chairman to be elected every year.

[Three different schemes were submitted by Mr. Grasby, but at the suggestion of the meeting this one was selected by him for criticism.—EDITOR.]

2. The improvement of the Branches.—I have always considered it a defect in our organisation that it limited the number of Branches too much, and that it lessened the influence of the Branches by limiting the membership. A Branch Bureau is, or should be, a local organisation for mutual self-improvement, and for securing instruction from outside ; and I cannot see why we should not get as many people as we can. To this end my first suggestion is—

1. A Branch Bureau should consist of (a) an executive of full members, appointed as now, and (b) ordinary members, elected by the executive ; any vacancy on the executive to be filled by an ordinary member, nominated by the executive, elected by the ordinary members, and the appointment formally confirmed as at present. Ordinary members to have all privileges of membership, except the management of the executive business, *i.e.*, the executive business committee.

2. The work of the Branches should be better organised and made the centres of agricultural educational extension work, as some are now, but to a fuller extent. Among the means for increasing the work and usefulness of the Branches I would suggest—

- (a) Reading courses, like those of the Cornell University.
- (b) Short lecture course, such as are found to be so very useful in connection with the Farmers' Institutes of the United States and Canada, Yorkshire College, Leeds, and the county councils of England.
- (c) Circulating agricultural libraries.
- (d) Elementary science classes, such as were proposed by the Stockport Branch in 1897.
- (e) The issuing of special bulletins.

In all these proposals there is little that is new; there is nothing revolutionary; there is nothing but what we may begin in a small way, and work up, as we have done the Bureau, to its present state. What is more, I think there is nothing for which Parliament will not find the money if the matter is taken up in the right spirit, and we show that we are in earnest by helping ourselves, by renewing our life as we do our crops, our trees, our vines—that we show that we place our work before our personal whims and predilections. We are engaged in a splendid work, which should benefit ourselves as well as our fellows, in which we will receive good in proportion as we freely give of the best thoughts and knowledge we have. Let our watchword be "Progress"; let our motives be unselfish; our attitude towards one another in this debate and in all our work generous and tolerant over points on which we do not agree.

MR. J. ANDERSON (Port Lincoln): Does Mr. Grasby propose that the department should have a paid chairman in addition to the present Secretary, or will the duties of that paid officer include the duties of a secretary?

MR. GRASBY: That is a question that I am not prepared to reply to off hand. It is really for the Minister to decide, because it is a financial question.

MR. ANDERSON: Mr. Grasby has given us an address that will excite discussion. With very much he has said I readily concur, but on some of the points I cannot agree with him. Although non-members have not the same privileges, our meetings are open to every young man or old man in the district. If they like to attend the meetings they can do so.

A DELEGATE: The young men will not come in.

MR. ANDERSON: If we increase the number of our membership we must necessarily increase the work of the officers of the Central Bureau as well as the most of the Hon. Secretaries. As it is there is a good deal of correspondence to be conducted.

THE CHAIRMAN: Are you going to propose that the matter be referred to the Branches for decision? It is evident that we cannot thoroughly discuss it to-day.

MR. ANDERSON: The question ought to be discussed at this Congress.

MR. J. SMITH (Hawker): I will move—"That we remit the subject to the Branches for consideration." I think it should be well discussed. I want to see our Bureau flourish. I want to see our numbers increase, and the suggestions thrown out by Mr. Grasby are very good ones. I think every one should be allowed the privilege of being a member and attend the meetings of the Branches. A lot of young men will not attend because they are not recognised as members. People want to be acquainted with the objects of the Bureau and learn the value of its work. I sincerely hope that the suggestions thrown out by Mr. Grasby will be acted upon. We should do all we can to get the young men to attend our meetings. I think it is obvious that some alterations are wanted. The members of the Branches should elect the Chairman and the Secretary as in the past, and it is a good idea to have an election every year.

A DELEGATE: That is being done now.

Mr. SMITH: But not so far as the Central Bureau is concerned.

Mr. LAURIE (Port Pirie): I second the motion.

Mr. WHITTAKER (Port Broughton): I consider we ought to have a discussion here, although I think it is very necessary that it should afterwards be referred to the Branches. I think there is some need for alteration in regard to the Central Bureau, for I am afraid that it is not what it used to be. We used to have a number of members of the Central Bureau reading papers at their meetings, but it is not so now. In the Branches there might be different methods; discussions are held, but no decision is arrived at. That ought not to be. If a subject is discussed there ought to be some decision on the matter. I maintain that everything ought to be brought to a head by having the subject put to a vote. After the meeting is over we do not know where we are. If resolutions are carried one way or the other then a record can be kept and the proceedings are preserved.

The GENERAL SECRETARY: You ought to carry your resolutions into effect.

Mr. WHITTAKER: Yes; and then we are bound to bring out the opinions of the whole of the Branches. In regard to the extension of the Bureau I may say that we cannot get the outsiders to come. All the farmers ought to come so that we might get the benefit of their work and their experience. The Bureau exists for the farmers, and they should take advantage of it. The *Journal* has done a lot of good, but if the meetings were properly conducted the *Journal* would contain more information.

Mr. WILSON (Port Pirie): I am very pleased with Mr. Grasby's address, although I think it is rather a bold scheme that he has submitted. For my own part I think he has aimed rather high, but I hope he will live to see the suggestions carried out. I think the Branches of our Bureau could be improved. I would like to see our Branches become authorities on agricultural matters and looked upon as such.

Mr. CLOUGH (Mylor): I have always advocated an increase in the membership of the Branches. I do not believe that if we increase our membership the Bureau will become unworkable. The meetings should be made interesting, and everybody given the chance of becoming members. This would make the Bureau popular.

Mr. LEHMANN: I was secretary of a Bureau for eighteen months, and had a little experience in regard to the meetings. We found that there was a necessity to include young men and bring them into the work. Still there is a difficulty in getting them to join. They think too much of muscular exercise nowadays. Young men spend their time mostly in trying to excel in physical strength and not to improve their mind.

Mr. LAURIE (Port Pirie): I think it would be better to discuss this subject in the various branches when we could go more fully into it. Still, I think Mr. Grasby's scheme wants a little modification, but the subject is well worthy of consideration.

Mr. W. GUM (Amyton): So far as I could see a very important matter has been left untouched in the scheme proposed. In all his suggestions I did not notice one that would make the meetings of the Branches more attractive. That is a point worthy of close attention. The Branches should have notice of what the subject is going to be, so that they can come prepared to discuss it. I am afraid that in very many Branches this is not done, and consequently there is a lack of interest. That remark does not apply to the Branch I represent. We never hold a meeting without knowing a month beforehand the subject to be discussed; so all the members are prepared to speak. We always get somebody to prepare a paper and initiate a discussion. We have a programme drawn up, and every member is put down for a paper. If he does not select a subject for himself he has one selected for him, and he is expected to write on that subject.

A DELEGATE: Does he do it?

Mr. GUM: Certainly he does; we have a paper every meeting.

Mr. R. CAMPBELL (Millicent): I was pleased to hear Mr. Grasby's suggestions. Reference has been made to the extension of the Bureau. If we have a large number of members in our Bureau it will be necessary to have a paid secretary. The increase would entail a considerable amount of work. The *Journal* ought to be sent to every member of the community. I believe in New South Wales they do this.

The GENERAL SECRETARY: No.

The CHAIRMAN: They do it in the United States.

Mr. CAMPBELL: In the United States every farmer who has his name put on a list can not only get papers of this description, but every document published in connection with what we call Royal Commissions.

The CHAIRMAN: Mr. Grasby's paper is, in my opinion, only a flash in the pan. (Laughter.) Unless he brings forward one definite scheme very little good can come of his proposals. He has submitted three different schemes; they would be discussed in the different Branches. I do not think any decision would be arrived at. If Mr. Grasby will tell us which proposal he would put before the others there would be something before the Branches.

Mr. CAMPBELL: I suggest that the matter be deferred, and that twelve months hence Mr. Grasby should come forward with a definite suggestion.

Mr. GRASBY: I will make it now.

A DELEGATE: Yes; let us take the suggestion at once.

Mr. McEWIN: In regard to the paper I might say that I did not know that there were any weaknesses in the Central Bureau.

A DELEGATE: Oh.

Mr. McEWIN: I do not think so when I consider the constitution of the board. With one or two exceptions, I think the Central Bureau consists of good practical men, and their experience is worth the experience of twenty young men. The members are well up in agricultural matters, and, except a few, are interested in the work. Their advice is worth a great deal. With regard to the suggestion that there should be a permanent head I think the permanent head at the present is quite sufficient. Still, there might be something in the suggestion that one-third of the members should retire each year, and that the number of members should be limited to twelve.

Mr. GRASBY: I provide for twelve in addition to four officials.

Mr. McEWIN: There might be something in that suggestion. I do not think there will be any trouble in getting members for the Branches of the Bureau; at least, not the trouble that some think. We have fifteen members at Brinkworth, and I think the number might be raised a little. It should be our aim to try and put some enthusiasm in the meetings of the Bureau, and then our meetings might attract and do good.

The GENERAL SECRETARY: A good deal has been said as to the non-attractiveness of the Bureau meetings. All I can say is that certain Branches send me down reports of their meetings time after time which are only interesting to those who attend. There is nothing of interest to anybody else. Surely the Branches could discuss subjects that are of general interest. I would suggest that the members carry a small notebook and pencil, so that they could put down anything that strikes them. If they are observant something will suggest itself to them as worthy of discussion, and then they could bring it forward when the meeting is held. The meetings should be made attractive, and every member should be expected to take some part in the meetings. If it is a debatable matter then a vote should be taken on it in order to get the consensus of opinion. By that means it can be seen who are in favor of certain proposals and who are not.

Mr. GRASBY : I will take the Chairman's advice and submit for consideration one of the proposals I made.

A DELEGATE : What about your suggestion as to the constitution of the Bureau ?

Mr. GRASBY : I would like to say that there is not one member in the Bureau that I have an unkind feeling against. I would like you all to understand that I particularly desire that this shall not be a personal question. My proposal has been actuated by a desire for the general good. I know and value all the work which has been done by members and our worthy Chairman here, whom I esteem and admire as a model of good nature, and I honor and I value the work he has done.

A DELEGATE : Hear, hear. We all do.

A DELEGATE : Does Mr. Grasby propose that any of the members of the Bureau should be paid ?

Mr. GRASBY : No.

The motion — "That the proposal be submitted to all the Branches for consideration" — was carried.

WEDNESDAY EVENING SESSION.

The GENERAL SECRETARY : Before the proceedings commence in the regular order I have a very pleasing duty—pleasing to myself and pleasing to the rest of you I am sure—in making a presentation on behalf of the whole of the Agricultural Bureau to our Professor, who is going to leave us. We all regret that he is going — (cheers)—and we all hope that in the new position that he is going to occupy he will find a congenial and happy life. We cannot help regretting that he has seen fit to sever himself from this place now he has become so much more useful than when he first came. He has been with us a good long time, and during that time he has unlearned as well as learned a good deal that has been of advantage to us in this State. He has been conducting many experiments, the final results of which we would have liked to have had the details of. As a scientist he has not given us details until he has been satisfied his conclusions are correct. At the same time we must regret when he has got so far in his inquiries that he has seen fit to leave off before perhaps his work has been properly finished. However, to-night he will tell us the results of some of his experiments and observations. I will ask the Professor to accept this framed address, which I trust the Professor will be able to hang up in the parlor and keep it for the rest of his days, and then hand it down to his successors. The Branches were asked to give a nominal sum towards it, and the response was nearly unanimous. I have also the pleasure in presenting him with a pipe and a walking stick. On behalf of the Bureau I ask the Professor to accept this address and the other little things. (Loud cheers.)

Professor LOWRIE, who was received with cheers, said : Mr. Chairman, Mr. Secretary, and gentlemen—I did not anticipate to have to begin speaking to-night in the manner in which you have rendered it necessary for me now to do. I have only to say that I am grateful in the extreme for the kindness which has prompted you to present me with the address, and with the pipe and the walking stick. I am afraid I shall want yet another size of hat, though I believe in Newton's law that action and reaction are equal and opposite, that the many kindnesses I have had offered to me surpass what I am in any way worthy of, and the statements which have been given as opinions of the work I have been able to do have been, I have always felt, prompted by the kindness of the givers and expressed in terms higher than my little work justified. On the other hand, I have not been able while working in South Australia to satisfy everyone, and I am satisfied of this : that had I satisfied everyone, or had any public servant in this State done so, his virility would have been wanting.

(Cheers.) If a man has any individuality whatever he must have opinions—(cheers)—and naturally those opinions cannot harmonise with everyone to whom they are addressed, and neither is it possible at all times to understand the motives which may prompt many of the public in acting as one experiences they do; and yet they may be prompted by a spirit of justness and by a notion of high duty, and feel it their duty to express opposition to what one may be doing, and not spare the individual for the sake of the cause. They are assuming for us the opinions they are working against. I know this, and in thanking you I will say I have honestly endeavored while I have been in South Australia to fill the bill as far as it was possible for me to do. I do not think it is altogether understood, gentlemen, that in South Australia, as a Department of Agriculture, we are understaffed compared to what is the case in the other States. It is not altogether necessary that the staff should equal the staffs in the other States. It is a smaller population to begin with, and the total wealth of this trade is less, and one cannot expect therefore to have the fully-developed departments they have elsewhere, but at the same time I would thank those who criticise what one has been able to do and who refer to the expense at which it is done to take a quiet fortnight or three weeks and go thoroughly into the organisation of these departments with which to disadvantage they compare the Department of Agriculture in South Australia, and if they will honestly do that I know very well they will be the first to say they are getting a handsome return for their money. (Cheers.) In none of the other States has the Principal of the Agricultural College to engage in work, for example, that I shall be doing presently. There is no departmental work at all. I will have no departmental work in New Zealand. It will be as if I am in the college, and am not bound to go outside of it or say a word outside of it. Here a man has to devote part of his time to teaching and examination papers; he has to manage a fairly large farm, which is a work in itself; he has to conduct departmental work, which is very extensive, and in the last few years it grew very heavy. One man has to undertake that; he has to travel in the country now and again and lecture, and take several days in the process, and then after all he is expected to keep everything up to time so that his greatest critics shall find not a vestige of anything unsatisfactory about his work. (Cheers.) In thanking you, Mr. Chairman and gentlemen, for the kindnesses you have shown me I will say that, to some extent, I wish I had been able to do more in South Australia, and I myself only know how many are the openings in which it would have been possible to have made development, but which are now untouched because I had not the opportunity. Therefore I take it that you give evidence that my heart was in it, and of that myself I am satisfied. (Cheers.) I shall ever remember, gentlemen, the kindness I have had in South Australia from the farmers from one end of the State to the other. (Cheers.) We have now and again had arguments, sometimes a little heated for the moment, but I believe we have understood each other, and I am sure the farmers have understood me a great deal better than those who sometimes claim to voice the opinions of the farmers. (Cheers.) I do not suppose in any part of the world is there a place to be found where those who are working scientific agriculture or are teaching scientific agriculture have more the sympathy of the farmers in their efforts and get better appreciation of what little they may be able to do than I have in South Australia. (Cheers.) I am conscious of that, and I go, I confess it, from the department with considerable reluctance, but I have felt that it was either a matter of going now or of going feet first, that I was not able to carry out the work—my health could not stand it to go on as I have been going for years past. It was the one alternative or the other for me, and I took the other alternative, and that even not without considerable thought. Thanking you once more for your kindness. (Loud cheers.)

Agriculture in South Australia—Its Progress and Possible Future Development.

PROFESSOR LOWRIE said : Now I am more at home. I am better pleased to be able to talk on this matter, and I think better able to talk on it than to talk in the strain that I have been doing. I was asked some time ago by some members of the Central Bureau to repeat the address I delivered at Strathalbyn, but in so far as that address was delivered there and at one or two places in addition, I thought it would be better for me to take a more general review of what has been going on in the time I have been working in the department. If we take the averages of the last few years, and look at these only, we are inclined to think that there has been very little progress indeed. I am not able to give details for last year, but if we consider the years preceding we are inclined to the opinion that there has been very little progress. Even with that before us, and even with the fact that the area has not extended, I still hold that there has been considerable progress in South Australia during the past few years. The cycle of bad seasons, especially these dry springs we have passed through, have been, even for this State, phenomenal or unprecedented. I take it that the prolonged drought in the North has been the means of making the average look so small, and had it not been for the improvement in our living on the products of the farm I am very certain that we would have found ourselves in a very deep hollow indeed. Taking the last five years we find that our average has worked up to what it was in South Australia when the land had its virgin wealth, or a good part of it. It has never been very much higher than during this period. Ten or twelve years ago we were crying out that the land was exhausted, and I say that had it not been that the farmers adopted very widely more forcing methods that exhaustion would have come home very severely indeed, and instead of averaging 5bush. to the acre we should have been glad to have had a half of it over the country as a whole. That would have been the position. I will take the main improvements that have been made in our work—First, early fallowing. No doubt this was practised years ago—twenty years ago at least, long before I was in the State, and long before this Bureau was formed—by individuals, but by the general mass of the farmers it was not done. Again and again I have tried to explain what seems to me a satisfactory hypothesis, that is, that this increase and conserving of moisture is the means of keeping ferments in the soil. The benefit from early fallow is certainly due to a very great extent to the influence it has on the lower forms of life in the soil. To some what I am saying has been said already, but to others it is new, and so it is a matter that should be thought over, and I make no apology whatever for preaching what is to some extent an old sermon. The very existence of these ferments in the soil twenty years ago was not dreamt of. It might weary you if I were to endeavor to give you a history of the discovery of the facts relating to them, but I can tell you this: that probably nothing in agriculture has created more controversy between the highest scientific minds than this very subject. Some of the very ablest men opposed the notion that such a thing is possible; but others again hold that it is possible, and they have given ample and convincing demonstrations that these organisms are at work, and that they are beneficial to the farmer if only he gives them the opportunity of working. Like the plant life, they require certain conditions to live healthy and propagate freely and show full activity. They require moisture and heat and aeration. We have got heat in our fallows in the summer time, and by working the soil well in the winter we get aeration and go a long way to secure moisture, because it has been demonstrated that these ferments will be in the fullest activity with 15 per cent. of moisture in the soil. With as low a percentage of moisture as 5 per

cent. they will still continue to work, although not so actively. There are these organisms at work, and if we leave our land unlifted so that it is dry right down they are exhausted and have no vitality. We have death. This is progress I think, because, although the farmers may not have understood the subject altogether, the fact that they have learned the benefit of early fallowing is undoubtedly progress. Now, as to the use of artificial manures. Now, on that matter I think I have had more arguments than any man in this room—both as to the kind to be used and the quantities. Well, to-night I have the matter in facts and figures, and they are something, I think. Yet the growth of the appreciation of the value and importance of their use is progress, and progress of the kind that the people of the State of South Australia have to be grateful for that their farmers have come to appreciate it. (Applause.) It took me some time, at any rate, to realise that there should be so little value in nitrogenous manures in this State for cereals, for I had their value taught to me as a student in Great Britain. Then when I came to South Australia we used it in small quantities, because in the early days when we dealt in tenths of acres we had not money to go very much further. If I had suggested in those early days of spending 9s. an acre on the college farm on manures I do not know what would have happened. (Laughter.) I simply would not have been able to obtain the money; it would have been called extravagance. That was the position in the early days; but the position is different to-day. The nitrogenous dressing did not tell on the wheat to anything like the same degree that it does in wetter countries. Where there is a leaching of water in the under drains there is also a leaching of soluble matter, and nitrates are very soluble. Well, there is in many countries this drain on the land of the fertilising material. In our dry climate we have not this drain, and we have apparently a much-increased ferment action, a much more rapid storing of the nitrogen of the air by the soil, and therefore I found through these years that we cannot use nitrogenous manures with profit. I have been trying to give the information. It certainly is a fact that works out in practice.

To illustrate his remarks Professor Lowrie had the following tables prepared and exhibited, and he subsequently referred to them:—

No. 1.—*Manure Demonstration Plots, 1899-1900.*

Total rainfall, 1899, 14·8 in.

Plot.	Manure.	Quantity.	Yield.
		Cwts.	Bush.
1	Lake Fowler	2	11·27
2	Guano	2	10·16
3	No manure	—	7·47
4	Thomas phos.	2	15·3
5	Thomas phos. (2) + nit. soda (1)	3	15·28
6	Thomas phos. (2) + mur. potash (1)	3	15·55
7	No manure	—	6·17
8	Thomas phos. (2) + nit. soda (1) + mur. potash (1)	4	13·49
9	Ohlendorff's dissolved guano	2	19·55
10	Bonedust	2	7·11
11	Bone char.	2	5·44
12	Lawes' super.	2	18·53
13	Lawes' super. + bone char.	2	15·22
14	Lawes' super. + bonedust	2	15·30
15	No manure	—	6·21
16	Lawes' super.	1	14·48
17	2cwts. Lawes' super. + sulph. ammonia, $\frac{1}{2}$ cwts.	2 $\frac{1}{2}$	19·4

No. 2.—*Demonstration Plots, 1900-1901.*

Total rainfall, 1900, 19in.

Plot.	Manure.	Quantity.	Yield.
		Cwts.	Bush.
1	Lawes' super., 38-40	2	24.46
2	Lawes' super., 36-38	2	26.48
3	Lawes' Peruvian guano	2	25.52
4	Lawes' dissolved bone compd.	2	23.42
5	Vitriolised bones	2	24.27
6	Lawes' special corn and potato manure	1	24.17
7	Lawes' potato manure	2	23.58
8	Rape meal A (6½ per cent. nit.)	2	27.7
9	Rape meal B (5 per cent. nit.)	2	25.19
10	Rape meal A (1) + super. (2)	3	20.43
11	Rape meal B (1) + super. (2)	3	22.36
12	Bally bonedust	2	24.17
13	Adelaide Chemical Works' complete manure	2	27.14
14	Adelaide Chemical Works' super.	2	31.45
15	Adelaide Chemical Works' super. B	2	27.17
16	Adelaide Chemical Works' mixture (not branded)	2	23.5
17	Adelaide Chemical Works' guano super.	2	24.23
18	United Alkali Co.'s super.	2	26.38
19	United Alkali Co.'s dissolved bones	2	25.30
20	United Alkali Co.'s grain manure	2	25.49
21	No manure	—	19.41
22	Thomas phos.	2	21.47
23	Thomas phos., mur. of potash, nit. of soda	396lbs.	23.0
24	Thomas phos., nit. of soda	284lbs.	22.9
25	Thomas phos., mur. of potash	3cwt.	23.35
26	Sheep Brand super.	2	31.34
27	No manure	—	20.26
28	Lawes' super.	1	23.40
29	Lawes' super.	1½	26.0
30	Lawes' super.	2	30.16
31	2cwt. Lawes' super. + sulph. of ammonia, ¾cwt.	2¾	32.8

LIGHT V. HEAVY DRESSING OF MANURE.

No. 3.—*Comparative Net Gains per Acre.*

1899-1900.

Manure.	Yield.	Value of Increased Yield.	Net Gain.
No manure	Bush. 6 19	£ s. d. — — —	£ s. d. — — —
Lawes' super., 1cwt.	14 48	1 1 2½	0 16 1½
Lawes' super., 2cwt.	18 53	1 11 5	1 2 11

1900-1901.

No.	Manure.	Yield.	Value of Increased Yield.	Net Gain.
27	No manure	Bush. 20.26	£ s. d. — — —	£ s. d. — — —
28	Lawes' super., 1cwt.	25.40	0 8 1	0 3 8½
29	Lawes' super., 1½cwt.	26.0	0 13 11	0 7 4
30	Lawes' super., 2cwt.	30.16	1 4 7	0 15 10

No. 4.—Wheat Demonstration Plots, 1900-1901.

Wheat.	Yield.	Wheat.	Yield.
King's	33·36	Warwick	24·58
Gluyas'	30·42	Crittenden's	22·11
B. Innominate	28·42	Innominate	21·9
Neumann's	26·48	Steinlee	19·41
Jerkin	26·29	Gluyas'	22·5
Californian Purple	25·15	Fan	20·56
Total rainfall, 1900, 19·60in.			

Professor LOWRIE (continuing)—Now these [Table 1] were the plots I had in in 1899. This is the one I wish to refer to [Plot 17], Lawes' super. (2cwt. of super.) and $\frac{3}{4}$ cwt. of sulphate of ammonia. The yield was 19bush. 4lbs. If you look here [Plot 12] you will see we used 2cwts. of super., and the yield was 18bush. 53lbs., so that in Plot 17 there was a gain of 11lbs., but the $\frac{3}{4}$ cwt. of sulphate of ammonia cost somewhere about 9s. Now, in England 1cwt. of sulphate of ammonia is worth 5bush. of wheat extra. That was Lawes' experience. Then I can refer you to these sheets here [Table 2], where I have the same thing taught. There is the superphosphate again. This one [Plot 30] was treated with 2cwts. to the acre, and the yield was 30bush. 16lbs. Where the sulphate of ammonia was added it was 32bush. 8lbs. The increased yield was less than 2bush., but it did not pay to use that nitrogenous manure. To the orthodox agriculturist this is a matter that is difficult to grasp, and one has to wonder how long it will continue that we can use phosphatic manures and so increase the yield, and yet by adding to them nitrogenous manures like nitrate of soda or sulphate of ammonia increase the yield by so little. How long will that state of things continue? There is ample room for work, work not of the experimental kind, but work such as the distinguished scientist alone can touch. There is research work, biological work, and there are not many men who are specialists in that line, men who can devote their attention to the biology of the soil. If the condition of things was thoroughly worked out, and it was only understood how great is the biological influence compared with what it is in colder countries, the importance of this point would be better grasped. How much is the increase of nitrogen from the air as compared with those countries? If we knew this we would be able to say whether or not our soils will maintain the balance, whether the 11lbs. or 15lbs. per acre we are taking out in our wheat crops is more than replaced by the several agencies by which the nitrogen of the air is fixed in the soil. It will take a long time to work out no matter how eminent the biologist who is going to do it, and, more than that, it is a matter well worth working out. At the same time I can say that it seems to me that for those who practise what is apparently the best system in South Australia, that is taking a cereal crop once in three years, there need be very little anxiety indeed. I have been forcing land to the extent of three crops in four years, and even on that land the manures that contain nitrogen as compared with those that are purely phosphatic show little improvement at all. It seems to me it may be years before it will be exhausted. I think a man that is taking a crop once in three years will find that it will be many years before he has to use nitrogenous manures instead of phosphatic. I would like you to bear in mind, however, that by more frequent cropping and heavy cropping it may be possible to overtake the nitrogen in the soil; but when that does come about it is possible for you to spend the same money that you would have spent on phosphates on some manure that would return the nitrogen, because by that time the land would be rich enough in phosphates. At the same time let the opinion not be held too strongly that, because artificial manures have served you well in these last few years, you can afford to neglect the natural manure like the

farmyard manure. In some lands that cannot be done. So far it has not come under my notice here that the land has been rendered barren through the use only of artificial salts, and it is not likely, so long as farmers keep off the nitrogenous salts, that it will occur. Nevertheless, the artificial manures will tell much better, and come home much more profitably on the crop, if you take every opportunity that is possible to return the general manure of your farmyards, and take a different field for it each year. You will get better money out of the artificials if you have organic matter in the land. I have never been able to understand how so little use is made of the straw by the farmers. If you save it you will find some means or other of treading it down about your yards and absorbing the urine that would otherwise go to waste or filter into the soil. In process of time that will make manure, and though if applied at once and heavily to your crop you will get less, nevertheless if you distribute it at the rate of 4 tons or 5 tons per acre before you fallow—and get it into the soil—you will bring out the wealth that is in the artificial manures. I might say a word as to the different kinds of manures that I have used. You will see here [Table No. 2] last year's results. I am very sorry they will not be repeated this year. I do not think it will come within 6bush. of it, at any rate on the farm. You will see here that the superphosphates all the way down the different brands sold by the different agents are in their yield very much alike. Here this rape meal alone [No. 8] and rape meal [No. 9] seem to considerably increase the yield—to 27bush. and 25bush. I want to explain that that was an accident—not, however, an accident in weighing the result. It was the accident of the very dry spring we had last year. These two plots were very much later, and, as you remember, the season became cooler later on; but had the other plots ripened under similar conditions, instead of 27bush. and 25bush. they would probably have returned 37bush. and 35bush. Turning to the quantities to be used is where we touch each other on the raw. Someone took the trouble to write to the papers to say that if the College Farm only worked the land better they would find that it would not be necessary to spend all this money. Now, I will tell you what we have been doing in this direction. The Government bought a piece of land some time ago. The field was divided up into three. There was a block of about thirty or forty acres in fallow. Well, we lifted the fence and threw the whole thing into one field, and fallowed it all; thus some parts were twice fallowed, and this is where our experimental plots were. Does one want any better working than that—two successive seasons' fallow and kept clean? The land that was not manured and only with that double working gave a good return, and last year was one of the best I have ever experienced at the College Farm. The unmanured block gave us 20bush. 26lbs. to the acre; 1cwt. of superphosphates gave 23bush. 40lbs.; 1½cwt. gave 26bush.; 2cwts. gave 30bush. 16lbs. I know very well if it had been a farm of 5,000 acres, and on the theory in which I am working, it would pay me to use 2cwts. per acre instead of 1cwt. But I am beginning to get the old farm back to that condition that it does not require as much as 2cwts. There were portions of this land, however, that I do not think had had any manure on it, and this is the condition that a good deal of the land of the State is in. I think I can express what I mean in money value. In 1900 I gained from the 1cwt. of phosphates used an increased yield of 8s. 1d. per acre. [See table No. 3.] Many of you, from conversations I have had, I know got more than 8s. extra from the use of even 56lbs. But you were not working your land twice. Two years' fallowing makes a difference in favor of unmanured land. In 1900 1½cwt. gave an increased yield to the extent of 13s. 11d. per acre; 2cwts. gave an increased yield of £1 4s. 7d. In the previous year the net gain from the use of 1cwt. was 16s. 11½d. per acre, and from 2cwts., £1 2s. 11d., as shown in Table 3. Now, the gain does not apply simply to the wheat crop. The dressing with artificial manures comes home in

other things than wheat; it comes home in connection with your feed. Of course, every farmer should know best what quantity to use on his land. Everybody must find out for himself whether it will pay him to use $\frac{3}{4}$ cwt., or 1cwt., or $1\frac{1}{2}$ cwt. You cannot argue that 2cwts. or even $1\frac{1}{2}$ cwt. will be too much for you if you have never tried it. A good many think, however, that it is possible to do so. (Laughter.) I say that in this direction greater development is possible, and we can do more than we have done in the past through artificial manures. It is going to return money to us in a larger increase. I will give you an illustration of the value of this work, and the advantage gained from running sheep over the stubble land. This year I have 168 sheep and 104 lambs in a field of 150 acres, which must be considered good when the carrying capacity of the land previous to the use of these manures is taken into consideration. As far as I can read it it seems to me to be able to carry from half as much again to double as much. That land ten years ago would not have carried one-third of this stock. (Hear, hear.) I question if that field could have kept fifty ewes and lambs satisfactorily. I know this very well: that it would not have been in anything like the condition it is to-day. These lambs I reckon, if sold, would realise from 8s. to 15s., or somewhere thereabout. I am perfectly sure of getting 8s. an acre from that paddock from the sale of the lambs. See where the advantage comes in. From the lambs alone I am getting all the money paid for the manures that I used. It is in that direction of sheep, then, that we, as farmers in South Australia, must look for the special development of the future. We cannot forecast what the home market is to be, but we must take our chances in that; and from the experience of past years we are justified at any rate in believing that it will continue so, or something similar, in the future. (Hear, hear.) Our farmers are more appreciative of sheep than they were. I believe the farmer has come to realise the importance of the trade, and the fact that the sheep enrich the ground. We have practically three times the number of farmers keeping sheep now compared with a few years ago. A report of an address I gave ten years ago says—"On a farm of 700 or 800 acres he saw no reason why there should not be a £50 or £60 wool bill, and £40 obtained from sheep otherwise. The owner ought to have upwards of £100 a year for his sheep, and be nothing the poorer otherwise." That was in the days when the practice was neglected, and I was lecturing to a meeting of farmers in which I do not think there was one in twenty who kept sheep, and I was impressing upon them what a man could do on a farm of 700 acres. Sheep on a farm give you many advantages and profits which you could not otherwise obtain. So far as I can read there is no industry in this State that gives so much promise as this matter of keeping sheep, and breeding the best sort of lambs for export; and even if the farm should be small the farmers could keep a few sheep to advantage. You are getting the manure from your sheep, and so enriching the land; you are getting the wool, and altogether you are getting a handsome return. I think that if it is properly understood that fat lambs for export at any rate are to be handled with the very greatest care we will see—I am still thinking I am going to stay in South Australia—our lambs here will be on a level with the best fat lambs frozen in any part of the world. I do not think anything can be sweeter or firmer or better. I know there is a farmer in this meeting who has been many years amongst sheep in Great Britain, and he reckons that our fat lambs are nicer and plumper than anything he ever had the opportunity of putting his hands on. I do not see why it should not be so. Lambs elsewhere are forced on artificial food stuffs. They are fed on fodder crops, the flavor of which would very soon be noticed in butter if cows were fed on them, and to a certain degree you get it in mutton. I have tasted beef that fattened on white mustard, and the mustard was in the beef.

Mr. H. A. GILES (Mount Pleasant): Saltbush too.

Professor LOWRIE: Is that so? We have our natural vegetation, which is sweet, but if we will only feed our land as we ought to do we will get our lambs as fat and nice as it is possible for them to be; but if you send them down here and rush them through yards, and give them a kick as they go through, as men very often do, and lift them by the wool and throw them about, then South Australian lambs will never take first place in the home market. Lambs have to be handled as gently as if you were handling eggs or ripe peaches. However slight the bruise, only be the very faintest blood-burn, and though the manager of the produce dépôt, or the Minister, who takes such a deep interest in it—a manager could not take more—although it may pass their eye, they think it is not much, when it goes out of the chamber it is a big black bluish blur. Let us think of that blot, let us handle these lambs as they should be handled, and let the proper stock be kept.

A MEMBER: Shropshire rams.

Professor LOWRIE: Another here says Lincolns, and another there says Dorset Horn. I would object much to have lambs with three breeds in them. If you have Merino and Lincoln, that is two strains, and you put Shropshire on to that you get three. I have never tried it, and I am not sure whether any others have. If the College Farm had been big enough I would recommend that it should be tried, that we should get the two classes and keep them side by side, and take their total money returns on that particular land, and then I would be able to say whether the first cross or the half-bred lambs or the three-part bred, whether the Shropshire or the Lincoln, were the better money. I can only now argue from precedent, and I am arguing from the precedent of the South of Scotland and the North of England, than which there are fewer places in the world where farmers more appreciate sheep and know better how to work them. The conditions are different here. Their practice is to breed a three-part lamb and sell all the lambs, and they get a nice fine lot. Instead of having the Lincoln-Merino ewe and the Shropshire on top of that, I would have the half-bred Shropshire and the Shropshire on that. We can only argue from analogy. You would get a slightly less valuable fleece in the dams, but you would get a nicer, earlier, plumper lamb; and you can carry more of them, and I think it would pay you to breed them in that way. I have bred the Merino ewe and the Dorset Horn ram, and then put the Dorset Horn on the crossbred ewe. I do not know how that would compare with the three-part-bred Shropshire. Mr. Rankine, who has had as much experience in breeding lambs as anyone here, and as much success in it, goes for the Southdown sheep for lambs, and practically for the pure-bred Southdown. Well, my experience in this State is only with the Dorset Horn-Merino and the three-part-bred Dorset Horn. On Saturday I weighed a few of these lambs to satisfy myself, and the best of them were these weights—two were 114lbs. each, then 112lbs., then 108lbs., 107lbs, 106lbs., and down to 95lbs. The average live weight of the first thirty that we weighed out of 104 lambs. lambd in May, was over 100lbs. Most of them were the three-part bred lambs, though some of them were first cross. They would be 55lbs. or 56lbs. dressed, that is, getting too big for freezing. There was not a lamb down on the 1st of May, and if I had a good big flock I could have been shifting them some time ago. They come when the grass is forming on the stubble, and are away when the summer is coming, and thus we have the remainder of the feed for the sheep at the bad time, and that is where I think it is going to be a great thing in South Australia. By the time the feed is gone you have your stubbles, and everybody knows what they will do. There are one or two other things in which I think we have room for improvement. I wish to refer to another class of stock, the pigs. I think I can pass the matter of dairying because it is in the hands of a good officer of the department who can urge his own case as well as I can. All

through the Hills and in the South-East there is room for improvement, and it is now a matter of breeding. You have the factories and the medium for exporting your produce, but you have not got the stock yet up to anything like the quality it is possible to get them, and it is necessary that you should get them. In that matter I have differed from my colleagues on the Bureau. Many have been more enthusiastic over dairying than I have been. I have always had a leaning towards wheat and sheep for our northern country, though I have admitted that in the Hills and in the South-East, where there is a rainfall to grow forage crops they can make more money on the land with cattle, but north of Adelaide the improvement is to come from an improvement of the breed and the milking capacity of the cow, and that was for the farmers themselves. The Ministry have done much by introducing bulls. In that matter I did not strengthen their hands in any way. The matter of purchasing bulls for the farmers was begun, I think, by Sir John Cockburn, and for the reason, I do not doubt that good might come of it, but I think the farmer can appreciate good stock sufficiently to make him spend his last penny to buy a good animal himself. It is a different thing with horses. A man has only one or two mares, but he has enough cattle to require a bull for his own herd, and if he is anything at dairying at all he should think twice before he uses a Government bull. If I had a farm I would not do it. I would be satisfied with the animal I had bought—what pleased my own judgment and no one else's. When you get hold of that property and find how, starting even with third-rate cows and good bulls, you can bring your dairy herd into something nice and useful, you will have greater improvement in dairying than you have had, and that is considerable. Why I mentioned pigs is that before I leave work in this State I should like to tell you that were I to begin at Roseworthy in the same conditions as in which I started I should not ask to have pig pens built on the place. I have found out in my experience of the climate that the most profitable way to keep this class of stock is to let them graze in the field for a considerable part of the year. (Hear, hear.) That, I think, would be found the best plan, taking into consideration our climatic conditions. They are all the better for being out in the fields, and give less trouble. They are away from everything. A suitable pen can be made with bales of straw, and I have found this to meet all requirements. It is best to allow the pigs to be out for practically the whole of the year, and locate them some distance from your house. If you are fattening for porkers you can bring them into a field nearer at hand. In that case they need a little attention, and small fields are better; otherwise the plan I have previously referred to is better.

A DELEGATE: You are right.

Professor LOWRIE: Sometimes they want shade in the fields; otherwise I find they do remarkably well. I will tell you some of the prices realised by porkers sent from the College farm this year. The first lot sent down in a truck of thirty-eight animals returned £97; the next thirty-eight, £88; the next thirty-eight, £101. Now the lowest price for one pig was 14s. 6d., and the highest £4 10s. (Hear, hear.) That will give you some idea of the result of our method of dealing with porkers. (Hear, hear.) I think the Government should try to export frozen pork.

The TREASURER: We have tried hard so far. We have already shipped some.

Professor LOWRIE: It would pay well if we could send frozen pigs home from 100lbs. to 120lbs. I think we would gain something by it, although I do not expect it will come to anything like the lamb trade has done. Still, if it is developed on the right lines it ought to be made a profitable industry. I thank the meeting for the attention it has given me, and I want to say before I sit down, on this the last time I will address you as farmers in South Aus-

tralia, that it is my sincere hope that the State will continue on the road of progress it has been travelling and with greater success than in the past. (Cheers.)

The CHAIRMAN: On behalf of the large meeting here, I thank the Professor for the very lucid explanation that he has given of the demonstration plots, and with regard to sheep and pigs: but I do not agree with him that this will be the last time he will address the farmers of South Australia. (Applause.) I am sure the Professor will have a longing sooner or later to visit South Australia, and then he may give us something about the new experience he has gained since he left South Australia. (Hear, hear.)

Mr. HENRY KELLY: I would like the Professor to tell us something as to the yields from the different kinds of wheat.

Professor LOWRIE: Mr. Kelly has asked me to call attention to the different yields from different varieties of wheat. They will be seen in diagram No. 4. Of course every farmer must satisfy himself as to what is the best wheat for his district.

FOXES IN AUSTRALASIA.

A few years ago a thoughtless man in Victoria introduced and liberated some English foxes, for the purpose of hunting, in place of riding to hounds after a piece of oily rag. The animals found congenial conditions in the Australasian climate, and bred rapidly. Soon it became necessary to offer rewards for their suppression. The following particulars will show what the ill-considered action of one thoughtless man has cost the State of Victoria alone. The figures are supplied by Mr. F. E. Allen, chief inspector under the Vermin Act, and the money has been paid for scalps by the shire councils of Victoria:—

Year.	No. of Scalps.	Amount Paid. £
1895-6	24,000	1,500
1896-7	22,000	1,406
1897-8	17,000	1,062
1898-9	22,000	1,375
1899-1900	20,400	1,275
1900-1	31,520	1,970
	<u>136,920</u>	<u>£8,588</u>

Let it be understood that the above figures refer to the payments for the State of Victoria alone, and for six years only; also, that the expenditure has been £8,588 for destruction only of 136,920 foxes. The damages inflicted by those foxes during their life would add considerably to their cost to the State, and it must be remembered that the foxes killed bear a very small proportion to the number left alive and continuing their depredations on the property of the residents of the State. Further, the foxes are rapidly increasing in numbers, and have crossed the borders of South Australia, where they have become quite numerous. A few days ago one was trapped on Hindmarsh Island, near Goolwa. Shortly before that two were shot on one day on Mud Island, adjacent to Hindmarsh Island. Along the sand hummocks between Lake Corong and the sea there are many foxes, and they may be seen even close to the Murray Mouth. In the South-East they are being killed by the hundred every year. In the so-called Ninety-Mile Desert the foxes have overrun the place. Attention has been directed from time to time to the constantly increasing vulpine pest, but no action has been taken outside private effort to cope with the evil, which, if left much longer undealt with, will cost this State enormous sums of money to reduce to controllable limits.

MILDURA NOTES.

The forming of the Woomelang to Yelta (*via* Mildura) railway route is at length in actual progress. Tanks have been in course of making for the last two months along the route, and earthworks are now in actual course of formation both at the Woomelang and the Mildura ends of the line. As the transfer of land for railway purposes has not yet taken place within the town and settlement itself, work has started on the outskirts of the settled area. As yet the number of men at work is small. The assured certainty of railway construction will no doubt speedily attract fresh population to this place and in all respects "make things hum" for a while. Residents are jubilant, but the increased rates which will inevitably need to be levied, for some time, at any rate, in fulfilment of the shire guarantee to contribute towards any loss in the working of the line, when added to the increased water rates which the Irrigation Trust must certainly demand before long, will help to make some of us realise that the enlargement of our privileges brings with it also a decided increase in responsibility. Ultimately we must benefit immensely by being able to place fruit on the market whenever desired, instead of being dependent on the caprices of the river waters.

The probable increase in settlement in the near future is forecasted by the report of the secretary of the Irrigation Trust of the area of abandoned land again brought under cultivation since June 30th of last year. No less than 610½ acres have been replanted since that date. Of this area more than half has been planted with Gordo Blanco vines, a third with sultanas and currants, eight acres with potatoes, and only ten acres with trees. And this may be taken as illustrative of the tendency towards the conversion of Mildura orchard lands into vineyards.

The products of the vine certainly yield larger returns, generally speaking, than are obtained from orchard trees, but the wisdom of hastening to place all the eggs of the settlement in one basket may well be questioned; this more especially in view of the almost inevitable introduction of phylloxera amongst us in the probably near future. So far no organised effort has been made to prepare for the coming of the phylloxera or to guard against its introduction into the settlement. A short time back a mild local excitement was caused by the arrival of a bundle of vine cuttings from a Bendigo nursery believed to be within the restricted area, and by the influence of the *Cultivator* editor, and with the consent of the consignee, the cuttings were burned. The Secretary for Agriculture has since declared the nursery to be, so far as is known, free from phylloxera and without the restricted area, but it is at least within the danger zone. Drastic action for the protection of the settlement is advised, and it is suggested that all imported vines or trees should be treated with hydrocyanic gas in a Burnley fumigator.

The determination of Melbourne merchants not to buy Mildura raisins or dried fruits till after the declaration of the tariff seems to have broken down at last, and fairly large sales have been effected. But the citrus market has been in a deplorable state throughout the season. Regular lemon shippers have been fortunate if they have netted over 1s. 6d. per case, and in some instances shipments have barely paid expenses. Last year's experiment of trying the London market has not been repeated; the results of the venture were too disastrous. Cured lemons may later on help to retrieve the losses on the fresh fruit, but prospects are not considered good. Prices for late cured fruits are largely determined by the time of arrival and condition of the first Sicilian shipments.

Welcome rains during the last month have not only saved the pastoralist throughout the Riverina, but have ensured a certain amount of feed locally.

Chaff, of very inferior quality, at £5 per ton means a serious item in expenditure to many horticulturists. Fortunately the rising of the river, consequent on the recent rains, ensures the certainty of continued supplies of fodder, such as it is.

The settlement has been revisited by Mr. Chris. Mudd, F.L.S., &c., a man of great botanical attainments, late of Cambridge Herbarium and botanist to H.R.H. Prince of Wales, &c., &c. He has been busily taking notes about conditions of vegetation here and missing no opportunity of imparting botanical information. He has been conducting a long series of experiments in connection with our saline lands, and claims to have discovered a means of chemically neutralising the salt and at the same time converting it into a manure. If his method proves successful it will completely revolutionise conditions of horticulture here and in other irrigation areas. Mr. Mudd is extremely scornful at the destruction of our native forests, and, in common with scientists generally, predicts direst results from wholesale deforestation. He strongly urges the planting of the Aleppo pine locally, with the object of growing the timber necessary for packing cases, &c.

THE CODLIN MOTH.

(From the Melbourne "Leader.")

Means of Destruction.

A correspondent writes asking for the best means to destroy the codlin moth. An effective remedy is here given, but it must be clearly understood that thoroughness is the great essential to success. Care must be given to the minor details, as neglect in this particular sometimes means failure.

When to Spray.

No date can be fixed upon, yet spraying must be done at the right time if the best results are to be obtained. The right time is immediately after the blossoms fall, and before the calyces of the forming apples close. If there are belated blossoms on the trees after the great mass of bloom has fallen, do not wait for them if some of the calyces are closing. If the trees do not all bloom nearly together, spray the early blooming trees first, and then in a few days spray the others. Repeat the application in one week, or at the latest ten days.

How to Spray.

Be thorough with the work. It will take more time and material, but if spraying for this insect will pay at all it will pay best to do the work well. Use a nozzle that throws a medium fine spray, not a mist, and direct it so that the liquid will be thrown into every blossom or calyx. A misty spray will not carry as well into the blossoms. To make a thorough application it will be necessary to direct the spray from at least two sides of the tree, and if the tree is large it will be almost necessary to apply from all four sides. In many orchards the trees are so closely set, so large and poorly pruned, that it is impossible to make a thoroughly good treatment for the destruction of codlin moth larvæ.

The one who directs the nozzle for the spraying will find it a great advantage to be elevated as high as the bed of a wagon-box at least. If the trees are large it will be well to use a step-ladder or a dry goods box in the wagon to elevate him still more.

Number of Applications.

Orchardists differ widely in opinion as to the number of applications that should be made. Some, noticing that the worms are most abundant late in the summer, think that spraying should be continued throughout the season of growth, and report excellent results from spraying five or six or more times. However, it is the opinion of those who have tested the matter most thoroughly at the various experiment stations of the country that it does not pay to spray more than twice if the two applications are properly made at the best time.

Poison to Use.

Here again opinions differ. Probably Paris green is as effectual as any if well applied and the liquid is kept thoroughly agitated during the spraying. Scheele's green would probably be as effectual as Paris green, is cheaper, and remains in suspension in water better. London purple and arsenite of lime are readily kept in suspension in water, but are slower in their action than the above-mentioned poisons, and probably less effectual in their death-dealing power. They have the advantage of being very cheap. Arsenite of lead is kept in suspension without difficulty, and is remarkable for its adhesive quality and its entire harmlessness to foliage unless used in great excess. It kills slowly, and its value for the destruction of the codlin moth has not been very definitely determined.

Preparation of the Poisons.

Paris green, Scheele's green, and London purple may be used in the proportion of 1lb. to 160galls. of water. It is best to mix the poison in a small amount of water first and then in the full amount for which it was prepared. For each pound of poison used add to the water 1lb. or 2lbs. of freshly slaked lime. This will lessen the liability of the poison to burn the foliage.

Arsenite of lime, by the Kedzie formula, is prepared as follows:—Boil 2lbs. of white arsenic and 8lbs. of ordinary soda for fifteen minutes in 2galls. of water. Put into a jug, and label "poison." When ready to spray slake 2lbs. of lime and stir it into 40galls. of water, adding a pint of mixture from the jug.

If this formula is followed, be sure to use a full measure of fresh lump lime, otherwise some of the arsenic will be left in solution in the water, and will kill foliage.

A somewhat simpler method of preparing arsenite of lime is to boil together for three-quarters of an hour 1lb. white arsenic, 2lbs. fresh lime, 1gall. water. Use 1qt. of this to an ordinary barrel of water (about 40galls.).

If a stock solution of this poison is kept, be sure to label it plainly "poison." and it will be well to put in some kind of coloring matter besides.

If arsenite of lead is employed, use not less than 1½lbs. to 50galls. of water. Lime need not be added to this preparation.

If more than two applications are made, do not use the poisons in more than two-thirds of the above strengths after second treatment.

PRESERVING EGGS.—One pint of water-glass to fifteen pints of boiled water gives the best solution that has yet been tried for keeping eggs fresh for long periods. Infertile eggs keep better than those where a male bird runs with the fowls or ducks.

THE dairy farmer who wishes to improve the quality of his milk must look to breed rather than to feed. The milk production of a cow is very largely a matter of nerves, and though it is possible to vary the composition of the milk for short periods by marked changes in the feed, extensive Danish investigations conclusively prove that the percentage of fat in milk cannot be permanently increased by any practicable system of feeding.

HORTICULTURAL NOTES.

BY GEORGE QUINN.

The Dropping of Flower Buds from Peaches.

It is a well-known fact among growers of peaches that most of the early-ripening varieties are notorious for casting their bloom buds on the approach of spring. Brigg's Red May, Amsden's June, High's Early Canada, Hales' Early, and Alexander's Early may be cited among the chief of those kinds thus afflicted. For a long time the sparrows were blamed for this deficiency. Closer observation, however, proved that these pests only rubbed out the already decaying buds. These early kinds are of the greatest value alike to the commercial supplier of fresh fruits and the amateur who produces fruit for his own table. The solution of this defect is worthy of our best efforts. The falling of the buds is possibly due to their immaturity at the time when the vegetative functions of the tree are suspended in autumn. It would be of considerable interest if readers of the *Journal of Agriculture* who cultivate these varieties were to note their experiences in connection therewith—(1) The influence of certain stocks upon the growth and maturing of the wood is one line upon which intelligent observation could be exercised; (2) The texture and quality of the soil, or its retentive or drying-out characteristics, and the value of certain manures is another direction in which tests may yield some information; (3) the thinning out of the vertical wood in spring or summer—during growth—to admit more light and encouraging the horizontal shoots may also prove of value in clearing up the difficulty.

Under the first proposition it is well known that the peach when matured upon an almond stock does not make such rank dense growth as when worked upon its own kind. The early-maturing influence of the almond tends also to slacken its vigor of growth earlier in autumn than when it is growing upon peach roots. The former effect is conducive to the admission of abundance of light all along the wood where the flower buds are forming. The earlier decline of growth allows a slower and more robust ripening of these flower buds.

Under the second suggestion a soil which dries out too rapidly may not ripen the buds sufficiently, whilst another of a very retentive character may be conducive to the continuance of growth too late into the autumn. The deficiency of phosphatic or potassic compounds in the soil may have a greater bearing upon this matter than at first appears evident. These tend to the proper ripening of wood and tissues, and consequently the stability of the laterals carrying the flower buds will depend upon their presence in suitable quantities in the soil.

The admission of more light to a limited number of horizontal shoots is one of the advantages to be claimed for the third proposition.

The checking of the sap, either by means of twisting or partially ring-barking limbs or trunks after the crop is removed early in autumn so as to induce an early cessation of vigor, may yield interesting results. When one notes the vigor of many of these barren trees the possibility of the bud-shedding being due to constitutional defects seem remote.

The Gumming of Peach Twigs.

The gumming and early decay of the laterals left for fruit-bearing is a serious difficulty confronting many peachgrowers. In the garden of a suburban amateur containing pretty well all the varieties grown in this State two particularly suffer from this defect. These are Elberta and Royal George. All of the wood left for fruiting has gummed more or less badly. Many of the

shoots are quite killed off. The trees are growing upon a strong clayish loam overlying a stiff red clay subsoil. The trees have made very vigorous growth in the past, and should be in full bearing. Manure and water have been applied freely. These sorts have been attacked badly with curl leaf (*Exoascus deformans*). I shall be glad to hear if any readers of these notes have had similar experiences under anything like similar conditions. Specimens of the twigs were submitted to Mr. McAlpine, the Vegetable Pathologist to the Victorian Department of Agriculture, who kindly replied that the "destructive fungus known as *Clasterosporium amygdalearum* was detected upon them," and states—"This disease is a frequent cause of gumming, and often responsible for the death of twigs." Mr. McAlpine suggests "thorough spraying just before the blossoms open will be found best suited to prevent the spread of the disease." Presumably the spray to be used would be Bordeaux mixture. The trees referred to in a suburban garden were thoroughly sprayed with this fungicide prior to the bursting—or rather when they should have burst—of the buds. No appreciable difference, however, was noticeable upon those sprayed. I have wondered whether there could be any connection between the damage caused by the *Exoascus* and the subsequent gumming. The varieties not subject to or suffering from curl leaf fungus have not gummed. I would be pleased if peachgrowers who suffer losses from gumming would compare notes with me for the general information of *Journal* readers.

Ring-barking of the Currant Vine.

During the past year I have been collecting evidence for and against this practice. Numerous photographs of ringed vines and unringed vines growing together, of bunches of currants at the periods of setting and ripening, were taken. The evidence at present appears somewhat perplexing. On vines of both Cape and Zante varieties the berries set much more evenly upon ringed plants. The weight of fresh fruit harvested vastly exceeds that obtained from similar vines not ringed. When dried separately the difference in weight is still great, but not so great as when the green weights are compared. The appearance of the sample is very much in favor of the fruit from the ringed vines. Against this the currants on the ringed vines take very much longer to ripen—a drawback in sun-drying. In flavor their lack of sweetness discounts to a great extent their superiority of appearance. Finally, the canes upon vines ringed show a strong tendency to remain immature when vegetation ceases in the autumn. This may be aggravated by the heroic method of ringing the main stem thus far adopted. Personally I think in most instances the ring excised has been too wide, thus postponing its healing over too long a period for the welfare of the plants. It would suggest itself that for the preservation of the vines the incisions should be made upon the parts of the plants that may be dispensed with and replaced from time to time.

Being seedless, the cross-fertilisation, or transference of pollen, has nothing to do with the fruit-setting of the currant. The better setting is evidently due to the temporary checking of the fullest functions of the plant. This need not be prolonged; consequently a narrow incision, which in the course of a few weeks will be spanned over, should be sufficient to effect the desired end, *I would suggest, when the blooming period has reached its height, one of the main arms* be ringed each year, taking out a piece of the bark about as wide as the back of the blade of an ordinary pruning-knife. It is very evident that as soon as the berries have become firmly set upon the bunches they require to be fed as vigorously as possible at this early stage.

If very narrow incisions are made so that they heal over rapidly and soon permit the functions of the plant to go on fully, the late-ripening difficulty

and the loss of saccharine matter may possibly be overcome to a certain degree. There is need for caution and carefully-recorded experiment in this work, as the currant-growing industry has possibilities in store for the vine-growers of this State. The risk of spoiling the already acquired good name for their fruits or severely damaging their vines should "give us pause" in this matter.

ORCHARD NOTES FOR OCTOBER.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

CULTIVATION.—There is no phase of orchard work of greater importance than cultivation for the conservation of soil moisture. We may raise fairly good crops of fruit for many years without pruning, spraying, or manuring; but without cultivation, in most districts, the results are quite unsatisfactory. No time should be lost now in pulverising the roughly digged or ploughed surface. In early dry localities this should have been done some time since. It should not be necessary to repeat the reasons for this procedure. Strangely enough, however, all fruitgrowers have not realised the necessity for this work. The object may be shortly stated as follows:—The sun's heat draws the moisture out of the soil by means of the spaces between the particles of soil. If the surface be hard it cracks, or if it be rough the upward passage of the moisture is facilitated. When the rough or cracked surface is broken into fragments, and kept in such a state, this upward movement is retarded. Evaporation, though not stopped, is checked, and the moisture retained in sufficient quantities to enable the trees to carry their fruits, foliage, and buds to maturity. This, of course, assumes that sufficient moisture has been secured in the soil during winter from rains or by artificial applications. The methods adopted to attain this end are stirring with the hoe or fork in the case of small gardens, or stirring with a narrow-toothed horse cultivator in larger areas. This supplies a continuous mulch all over the surface of the orchard, and is infinitely superior to a mulch of manure or other organic matter placed around individual trees. Many persons only cultivate a small ring around each tree. This method doubtless retards the escape of moisture from the cultivated surface. It should be borne in mind, however, that the moisture which moves between the particles of soil is not under the influence of gravity, but will pass laterally—sideways—through the soil and escape up into the air through the uncultivated spaces of ground between the trees.

MANURING.—In late localities, where abundance of moisture is still evident in the cultivated layer, the opportunity should not be lost of applying quickly-dissolving manures to trees in need of fertilising. Superphosphate is the most suitable at this stage to supply phosphate, and nitrate of soda, or sulphate of ammonia, to make up deficiencies in nitrogen. These manures to a very large degree immediately become available to the roots when worked into moist soils. Every starved tree, according to its size, should receive from 1lb. to 6lbs. of superphosphate, and from 4ozs. to 16ozs. of sulphate of ammonia or nitrate of soda. These should be scattered around where the feeding root tips extend. In an old established orchard this will practically mean the whole of the orchard surface. Smaller trees, however, are best treated as separate individuals, and a radius extending from just inside to about 3ft. outside the spread of the foliage dressed. If these are applied in front of the cultivator they can be worked directly into the soil.

NEWLY-PLANTED TREES.—The deciduous trees set out during the season just past will now be in active vegetation. After being set out they were probably pruned with care upon most approved lines. A careful observation

of the growth will reveal many points of interest. Buds intended to grow probably remain dormant, and unexpected shoots arise from unsuspected positions. Summer or green pruning now is called to the growers' aid. It will be well to consider how the well being of the tree depends upon its foliage before making any drastic movements. From the shoots that are growing the gardener should note those most suited to a continuance of the proper shape and balance of the tree. The remainder should not be sacrificed absolutely. It is true, in cases where twin base buds send out shoots of equal vigor where a single leader is wanted, one should be rubbed off. The leaders thus retained should be encouraged to grow with equal strength. Some will begin to outstrip their companions, and from out of these stronger shoots the merest tender sappy tips should be pinched, to temporarily check them, and enable their weaker comrades to catch up. The shoots not required as leaders should be treated similarly from time to time, so as to check them. If they were removed absolutely the elaborating surface of the tree would be reduced and its vigor restrained. From a physical point of view damage from sun scald might also be incurred by the lower limbs or trunk.

TRANSPLANTING EVERGREENS.—Although the best time to move citrus trees, guavas, and passion vines is when the sap is rising, they may with proper precautions be transplanted throughout the summer. The main points for care are in lifting to protect the roots from drying winds and sun heat, and proper care in watering and shading after they are set out. The need for keeping the roots well moistened makes their chances of surviving somewhat remote if long distances are to be covered from the nursery to their permanent site. If the roots are curtailed the tops should be cut back accordingly, and this should be at any rate partially done in the packing process, as a large area of foliage will draw off and transpire the moisture from the stems in transit, and thus reduce the vitality of the plants. When set out the plants must be watered and the soil made loose upon the surface as soon as possible. In hot places a roof of bagging or tree branches should be put over the top to shade the trees from the direct sun rays. If dry or cutting winds are prevalent, side shelters are advisable, but not otherwise.

BUDDING CITRUS TREES.—Where the stocks are sufficiently large and the sap active, buds could be inserted into citrus trees. Most beginners fail in this operation upon these particular kinds owing to the angular nature of the young shoots from which they obtain buds. These angular portions should be discarded, and only buds from rounded shoots, or lower down on the same shoot, be selected.

THINNING OFF FRUITS.—As the month progresses some stone fruits will require thinning off if the crop adheres thickly after the natural drop occurs. No fixed rule can be laid down for this work. The underlying principle to guide one should be the general health and vitality of each individual tree. When the trees are strong the ultimate size of the fruit dealt with should be kept in mind. In the case of peaches, one fine specimen is worth more than two small stunted fruits. This question should also be considered from the side of conserving the energies of the tree. It is generally admitted that the formation of the kernel and stone exercises a greater drain upon the resources of the tree than the pulp. In consequence, one may readily see that by reducing the number of fruits the benefits are far-reaching.

GREEN-PRUNING TREES IN BEARING.—This applies chiefly to the peach and nectarine. When the fruits are well set it will be noticed that many shoots left at the winter pruning for fruit producers have shed all of their buds or blossoms. These should be shortened back to the young shoots now arising nearest to the base. By this means the extension of the fruiting wood away from the parent shoot may be curtailed. Other shoots will be found on which

no fruits have set upon the upper portions. These should be shortened back to the young growth coming out with or above the topmost fruit. This is done to prevent overcrowding of the shoots, and the retention of a growth at the end is due to the need for drawing sap up or beyond the fruits. Crowded shoots arising from base or ordinary buds should be thinned out.

SPRAYING FOR FUNGUS DISEASES.—In late districts the first days of October will probably see some of the apple trees treated with Bordeaux mixture for the prevention of *Fusicladium* or, as commonly known, scab or black spot. I have always failed to see any practical gain from the treatment of peach trees with this mixture for curl-leaf after the leaves are expanded. The apricots in damp localities will be ready for a second spraying with Bordeaux mixture, and care should be taken to weaken the solution. One pound of bluestone, 1lb. fresh lime, to each 10galls. of water will be quite strong enough.

APHIDES AND SCALE INSECTS.—The black aphid of the peach also attacks the almond, cherry, apricot, and Japanese plum severely. The best spray wash is composed of 1oz. very strong tobacco and 2ozs. common soap, sliced up and boiled in 1gall. of water. The tobacco refuse is strained out prior to putting the wash into the sprayer. These insects are killed by contact, consequently every one must be hit with the spray. They breed rapidly. All of the rounded black ones are females, and they give birth to living young very rapidly compared with most insects; consequently, as the spray always misses a few, the work should be repeated within a couple of days. There is very little doubt that on larger trees fumigating is much more effective. I have used waste tobacco and cyanide equally successfully. The black scale will be breeding and spreading out upon the young twigs now. Resin wash or kerosine emulsion are the best remedies. These also kill by contact, and the insects must be coated to be killed. The dressing of citrus trees for red scale will prove more successful if carried out at a later period, say after Christmas. Of course, if discovered for the first time on trees in an orangery, the dressings should be applied immediately with a view to extirpating it.

COULIN MOTH.—On the plains the first moths come out from the winter-hidden caterpillars early in October. The young pears and apples are just then formed, and those who intend spraying should start as soon as the young fruits are discernible. The most approved formula is 1lb. Paris green (get Blundell's), $\frac{3}{4}$ lb. fresh lime, in 10galls. of water. Make the Paris green into a paste and then mix it with the lime water. To ensure a fair trial trees should be sprayed fortnightly. Another mixture which is being much more favored by American apple-growers is made by boiling

1lb. white arsenic,
2lbs. washing soda,
1gall. of water.

These are boiled for about an hour, until all solids are dissolved. This stock solution is then used at the rate of 1pt. in 40galls. of lime water. At least 5lbs. of fresh lime should be used in this volume of water. Great care must be exercised with this, as it is extremely poisonous, and all vessels used in its manufacture or keeping should be destroyed. It should be locked up and distinctly labelled, as the liquid stock solution is practically colorless, like water. All old bandages upon apple, quince, and pear trees should be removed and cleansed or burnt. The rough bark should be cleaned off and knotholes cleaned out, while broken ends of branches should be sawn away. These latter precautions should have been taken a month ago to obtain the best results. The fruit houses should be kept closed to prevent the escape of moths. The best indication of when to bandage again is the presence of small fruits upon the tree from which the sawdust-like evidences of infection are protruding.

NOTES ON VEGETABLE-GROWING FOR OCTOBER.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

The bulk sowings of the melon family should be made during this month. In large gardens the ground to be planted is usually heavily manured with decomposed stable manure prior to the ploughing being performed. In small plantations holes are opened out, say, 1½ ft. deep, and the manure is well mixed with the under layers. It is always wise to have several inches of soil above the manure so that the plants become fairly established before their roots reach it. If 3ozs. or 4ozs. of superphosphate be mixed into the soil of each hole—say of 3ft. square—good results will follow. The soil should be moist before sowing the seeds, and when they are set the surface covered with broken manure *and not watered until the plants appear* if it can be avoided. I would suggest the following sorts be tried:—Cucumbers: Long Green, Rollison's Telegraph, Man of Kent, Sion House (improved), and the Japanese climbing varieties. Water melons: Cuban Queen, Kolb's Gem, Rattlesnake, Seminole, The Boss. Sweet melons: Early Hackensack, Montreal Nutmeg, Victory of Bath. Pumpkins: Turk's Turban, Ironbark, Yellow Mammoth. Marrows: Long White, Custard, Tripoli Bush. Trombone: Green and White (the latter does not possess the true trombone flavor; it is known in America as Jonathan pumpkin). Pie melon: Long Green, Long White, Royal George (large round green). The setting out of plants of the above when raised in pots will be undertaken. They of course require carefully sheltering from the rough winds.

Tomatoes may yet be sown, but in most instances the young plants are now available for setting out. Although shelter from wind is desirable, frosts are scarcely likely to be of much trouble now. Acme, Ruby, Large Red, Mikado, are good stock varieties, producing sound firm-fleshed fruits.

The sowings of edible podded beans will now come along in regular succession every three or four weeks. In cool localities where stakes are available the runners are most profitable, but on the dry plains the dwarf kinds are more generally acceptable. The old favorite, Canadian Wonder, comes first, producing long narrow pods, but takes a long time to come to the blooming stage. Emperor William is a short-growing plant, carrying short flat pods and coming quickly into bloom. Dwarf White Caseknife is a good variety, and worthy of trial also. The soil should be in nice moist condition, either from rain or irrigation water, before the seeds are sown. When the drills are made, sprinkle a little superphosphate along the rows, sow the beans, cover slightly with soil, and then cover the drills with broken manure about 1in. deep. The ground should not be watered until the plants are through the surface. If it is applied the surface sets, even under the manure, and prevents a lot of seedlings from emerging in good condition.

Sometimes young plants of tomatoes and melons are attacked by green aphides. The presence of these pests are indicated by small crinkled curly leaves being formed. The remedy usually found efficacious is made of tobacco and soap. Boil 1oz. of the former and 2ozs. of the latter to each gallon of water. The insects are located beneath the leaves, and therefore the underside should be sprayed thoroughly. If the spotted ladybird (*Leis conformis*) is to be found on aphid-infested trees, transfer some to the melons or tomato plants.

The surface of the soil between all growing crops should be stirred with fork or hoe as often as possible. If loose stable manure—not necessarily rotted—be available, a thin mulching will work wonders in conserving moisture.

The saving of seeds from choice cabbage or cauliflower plants is of importance. The flower heads should be enclosed in fine cheese cloth before the blooms open to avoid the cross fertilisation of the flowers by insects. The covers should not rest upon the flower buds, and they may be removed as soon as the flowers fall away. It is a good precaution to pull up any inferior plants of the cabbage family that are showing bloom at the same time.

In the cool gullies of the Hills all kinds of vegetables will be set out similar to those planted in the winter upon the Plains.

HUMUS AND ARTIFICIAL FERTILISERS.

For many years agricultural authorities have regarded it as an undisputed fact that the exclusive use of mineral fertilisers over a period of years would soon result in the exhaustion of the organic matter in the soil, and that consequently, owing to the deficiency of humus, the land would begin to fail in responding to the application of such fertilisers. It has always been urged that where farmyard manure is not available for dressing the land occasionally green manure crops must be grown and ploughed in to restore the supplies of humus. Within the past few months however, Professor K. van Vries, of Groningen, Holland, has published a report on this subject which is sure to cause considerable controversy and enquiry by the agricultural experiment stations throughout the world. With a view to testing the accuracy of this widespread opinion he has for several years been carrying out experiments, the results of which are now published. Several plots on soil of the same character and in the same locality have received respectively chemical fertilisers alone and farmyard manure alone for many years. Samples from these plots have been carefully tested, and it is found by actual analyses that the soil from the plots receiving the chemical fertilisers is equally as rich in humus as the plots which have received considerable quantities of farmyard manure. The Professor estimates that a ton of well-made manure contains equal to one-tenth of its weight in humus (224lbs.), and spread on the land at the rate of 15 tons to 16 tons per acre, should enrich the soil to the extent of one-twelfth of a grain of humus to a quart of earth, assuming it is worked into the soil to not more than 8in. in depth. This being so, this difference should be shown by analysis, but three separate experimenters found that lands dressed with chemical fertilisers for fifteen years contain as much humus as land regularly fertilised with farmyard manure during that period. Professor van Vries explains this as follows:—Intense fertilisation with chemical fertilisers alone acts more thoroughly and effectively, and especially more rapidly, than the farm manure. It causes the production of more abundant and more vigorous crops, which leave in the soil valuable residues. These remains from preceding cultures are the principal sources of the humus of cultivated soils, and thus is explained the well-known richness in humic matter of the soil in Holland, where three times as much chemical fertiliser is used per acre as in Great Britain and elsewhere. The long-continued use of chemical fertilisers on plots at the famous Rothamstead Experiment Station also bears on this point and demonstrates that the fears of exhaustion of the organic matter in the soil are not justified. While humus is not directly a plant food, it is indispensable to the growth of plants. Unless the soil contains a fair proportion of humus, no manuring or cultivation will cause it to yield maximum crops. Humus is derived from the decomposition of animal and vegetable matter. The use of chemical fertilisers appears rather to increase than to diminish the supply of humus according to Professor van Vries' experiments. With good cultivation, including of course the use of fertilisers, we get heavier crops and propor-

tionately the roots left in the soil to form humus are larger and more numerous than is the case when a smaller crop is grown. The stubble and leaves left on the ground when harvesting the crop, and the leaves, &c., that fall to the ground during the growth of the crop all form humus. A stalk of wheat in the spring is provided with abundant leaves. As the crop approaches maturity these leaves fall away, and when harvest time arrives the number of dead leaves adhering to the straw is insignificant. As a very considerable proportion of the organic matter in plants is obtained from the air, it would seem only reasonable therefore that a heavy crop, which is not entirely removed from the soil, would add to the supply of humus in that soil.

FARM HINTS FOR OCTOBER.

BY THE EDITOR.

Hay harvest should be concluded as soon as possible. Hay is in its best and most nutritious condition when the grain is in the soft dough, but the color is not attractive to the human eye, and there arises a suspicion of "straw" when the green is not prominent. Exposure of the hay to rain, dew, heat, and light causes a loss of sugar, gum, starch, oil, and aroma, and the remainder is therefore deficient of nourishment to the extent of that loss. In this climate a very short exposure will cure the hay, and the sooner it is stacked and thatched the better. The stacks should never be built in places where water is likely to collect or flow, and it is desirable that the locality should be easy of access for hauling in or out. Precaution should be taken against access of fire through grass or in other ways, and the stacks should be enclosed to prevent trespass by cattle. To prevent fowls flying on to the stacks, push in a few sticks along the eaves, leaving 12in. projecting, and stretch fine wire at 6in. and 10in. from the eaves. These wires will throw the fowls back every time they attempt to fly on, and they will soon tire of trying.

Green manuring, especially on poor sandy soils, is not practised in this State to any extent, if at all; but there is profit and advantage to be derived from it. Lupins, peas, vetches, and other legumes give the best results, but any dense green growth will prove beneficial. Of course, if the land is not wanted for production of a crop next season, it would be better to feed the present green crop down with sheep. If to be used as a green manure, plough it under whilst in flower, and be sure not to delay until the plants are in seed. Mustard is a good crop to grow for green manure, as well as for sustenance for live stock.

Lucern seed should be sown on land that has been well prepared some time previously. The soil should be well settled, but loose on the surface. This can be helped by a heavy rolling, and shallow discing and light harrowing just before sowing. A field that has been well cultivated with a maize crop, and then well harrowed without any ploughing, would give the ideal conditions for sowing with lucern. The soil must be moist, else the greater part of the seed will fail to germinate; or, if it does, the young plants will die of drought. Twelve pounds of seed is enough to drill an acre. It is best to drill one-half one way and cross with the other half and roll the field when sown. In places where early frosts occur it is best to sow between September 20 and October 20.

There are many parts of the State where potatoes may still be planted. From 2cwts. to 5cwts. of seed per acre may be required, according to the variety to be grown. It is desirable, where horse hoes, &c., are to be used in cultivating the crops, that the rows should be 30in. apart and the sets 12in. apart in the rows. When the plough is used each third furrow is used for planting the

setts, which are covered to a depth of 4 in., and cross-harrowed. Some of the best American growers strongly deprecate hilling-up of potatoes for the reason that the richest soil is removed from the roots and piled up where it is unavailable. The soil nearest to the stems has already been somewhat impoverished by the plant.

Sow sunflowers to stand 3 ft. x 2 ft. apart on deep rich soil manured with potash and farmyard stuff. The leaves and stems serve as food for stock, and the seeds, if fed in moderation, are valuable for poultry and all farm animals, as well as for sale for oil-making.

Pumpkins, pie melons, and similar plants will thrive better from seed sown in October than if put in earlier. The stems or vines are very tender, and much damage may be done by the wind blowing them about, or even by shifting them by hand; therefore it will be wise to either put in a number of sticks, or to sow seeds of maize, so that the plants may be retained in natural position. Plants should stand 12 ft. to 15 ft. apart and the land should have been heavily manured with farmyard or cowyard stuff that has been kept and turned during two years.

Maize and all kinds of sorghums should always be sown in drills, so that the horse hoe can be frequently used to loosen the surface from 2 in. to 3 in. It is not good to cultivate much deeper because the roots will be injured. Stiff clay soils are unsuitable for these crops, but those of a light or even sandy nature will give good results, especially if some manure has been applied.

Unless the grasses are allowed to produce seeds they will soon die out, especially in the case of annuals. A portion of each paddock should be reserved every season for regeneration of pasturage by seed production, and it would probably pay well to run the scarifiers over many of the grazing paddocks and sow seeds of grasses and herbs, as well as to fertilise with superphosphate. Most of the native grasses and herbs produce seeds during the last three months of the year.

It is the duty of every owner of live stock to make ample provision for their sustenance, and it is to his advantage to attend to their comfort, because the animals will lose condition and health if these matters are neglected, and that loss of condition and health means loss of money to the owner. During the next three months summer fodder crops can be grown, silage made, hay and straw gathered. Whenever opportunity offers, a considerable quantity of fodder should be got together over and above current requirements, because no man can be sure that the next season will produce sufficient herbage to maintain the lives of his domesticated animals. "It is better to be sure than to risk being sorry."

When about to shear the sheep take great care to have a perfectly clean floor, and never tie the fleeces with string; use wool or worsted if the fleece must be tied. If string, straw, splinters, or anything of a vegetable origin gets mixed with woollen material it will not take the dye, and consequently the cloth is injured. Therefore the buyers will not pay best price for wool that is mixed with such impurities.

COPPER SULPHATE AS A FUNGICIDE.—Lodeman states that the first recorded use of solutions of copper sulphate for the prevention of fungoid attacks on trees is by W. F. Radclyffe, who in 1861 used it successfully in dealing with rose mildew. He used 20zs. of sulphate in a "stable bucket" of water, and entirely freed the plants from disease. His work appeared, however, to have been altogether lost sight of, and it was not until nearly twenty years later that the copper sulphate was experimented with in earnest. What an incalculable amount would have been saved to orchardists and vignerons in all parts of the world had Radclyffe's discovery been followed up by careful experiments by competent men!

POULTRY NOTES.

BY D. F. LAURIE.

Eggs for Sitting.

I am frequently asked to procure eggs for various correspondents, and as a rule, have a difficulty in getting what is wanted at a price suitable to the buyer. At the Bureau Congress it was stated by several that they had but little luck with sittings of eggs procured in Adelaide. It is my intention, with the approval of the Government, to endeavor to supply a long-felt want in the way of reliable eggs—not only as regards purity and fecundity, but also untampered with. As a rule those fanciers and breeders with a reputation always endeavor to serve their customers well, and are always pleased to hear of a successful hatch; others again seem unable to deal honestly. I have arranged with reliable breeders to supply Minorca and Wyandotte (Silver, Gold, and White) eggs at 10s. per sitting of twelve eggs, carefully packed, rail free to nearest railway station; also a few sittings from an exceptionally high-class pen of Minorcas at £1 1s. Instructions *re* sitting hens will also be given. This offer is open to members of Agricultural Bureau only, and all orders must be countersigned by the Hon. Secretary of the local Bureau.

Bone for Fowls.

On various occasions I have referred to the excellent results following the regular use of bone as a help to frame-forming in young stock, and egg-production among hens. At the recent show I took a number of breeders to the Australasian Implement Company's exhibit of "Mann" bonecutters, and we gave the machines an exhaustive trial. The bonecutters, which cost from 37s. 6d. upwards, are for cutting green or uncooked bone, which, if fed to laying hens will largely increase the supply of eggs; as, in addition to containing lime, &c., there is always a considerable quantity of fatty matter, which has a forcing tendency. About 1oz. or 1½oz. per hen twice a week is the usual quantity given when the eggs produced are for sale in the ordinary way. A lesser quantity should be given to breeding hens, as it is unwise to stimulate excessive laying in such cases, as quality and stamina are demanded in the progeny, and this we get from unforced hens. Green bone should be freshly cut, and on no account should be allowed to become stale and tainted. Bonemeal for young stock should be made from dry or steamed bone, as then the fatty matter is driven off and only the lime, &c., remains—this will aid in building up a strong frame, and is a great preventive of leg weakness. Such bone may be given to laying hens, and is not forcing in its effects. For a long time I have been on the lookout for a manufacturer of proper bonemeal made from selected bones, and it is with pleasure that I call attention to the very superior article manufactured by the Adelaide Chemical Works. The bone is nicely granulated, and of a size readily eaten by all classes of poultry. The process of preparation renders this bonemeal suitable for poultry, and it is not so liable to scour the birds. It is put up in convenient sized bags, and I trust it will be availed of by all poultry keepers. This bonemeal may be kept in a small vessel where the birds have ready access to it. I do not recommend mixing it with food, unless as follows: for chickens from eight to ten weeks old, and ducklings six to eight weeks. As a rule the birds will help themselves as they require it; if mixed with the soft food the male birds may get too much and their health suffer.

Diseases of Poultry, No. 1.

Much mortality from the diseases of poultry is due to neglect; in other cases a variety of causes conspire to bring about various derangements which, if taken in time, can easily be cured or alleviated. In dealing with the question I shall endeavor to be as clear as possible, and will suggest that readers cultivate the power of observation, so that they may easily note the difference between a healthy bird and one which is ailing. Every little point must be noted; the general appearance of a bird is as a rule a sure indication of its state of health. Illfed, illhoused, vermin-infested birds are prone to the attacks of disease. Birds subjected to undue exposure, or to very sudden changes of temperature are chilled and catch a cold which, if neglected, soon assumes a serious form. Forewarned is forearmed, and, while I tell the means of curing sick birds, it must be remembered that the successful and careful poultry keeper should have no sick or diseased birds in his yard. It is a good plan to keep a few simple remedies on hand, but it is not to be inferred that tonics and drugs are to be constantly given, as they are not necessary if the birds are properly cared for. At a later stage I will give a list of a few simple necessary remedies and their uses. Before dealing with actual disease I will refer to tonics and powders. To begin with, I have no faith in patent powders and egg-producing foods; they as a rule contain deleterious matter, and are in general forcing and stimulating, and often contain an irritant. Liver disease is largely caused by the use of certain stimulating powders, and during many years I have heard details of many disasters caused by their use. Again, many of them largely consist of oyster shell or bonedust, and people pay so much an ounce for what is usually bought by the hundredweight. I do not know of one of these mixtures, as offered for sale, that is of any value; some do cause the hens to lay, but always at the expense of future progeny. Pepper is a bad thing to use; it spoils the digestion and tends to liver complaints. Bonemeal, and ground or crushed oyster or sea shell are proper aids to success, but may be bought separately and cheaply. If birds are properly fed and housed no tonics or spices are required.

SALTS.—Where green food is scarce, and during hot weather the blood may be cooled and the system lowered by the judicious use of Epsom salts, in the proportion of a packet mixed with the water necessary to mix the soft food for twenty adult fowls or ducks. This may be given once a week.

IRON.—Many soils are deficient in iron, which is an important component of the blood, and is necessary for feather-forming. As a tonic for occasional use at all times, and regularly during the moult, and when epidemics are prevalent, there is nothing better than iron made up as Douglas' mixture. This has been used for many years with excellent effect. It is made by pouring half a gallon of boiling water on half a pound of copperas (sulphate of iron). When cool stir in a fluid ounce of sulphuric acid. All this must be done in an earthenware vessel, as no metal should be used, nor should this mixture be added to the drinking water contained in any metal receptacle. Of the above mixture a tablespoonful to each quart of drinking water once or twice a week is the dose. Where there is a difficulty of procuring sulphuric acid it may be omitted, but of course the tonic is not so good without it—without the acid the iron rusts the water, which the birds dislike.

COLDS.—For colds, and for use during wet weather, and the birds get a drenching from heavy rain, the addition of a little freshly-ground ginger is of service, and harmless to use. Add sufficient to impart a characteristic taste. It may be given with bran and pollard, bread and milk, &c. The following old and well tried prescriptions were published in Mr. Lewis Wright's poultry book many years ago, and are still in general use. The following may be given

for a sudden cold, but it must be remembered that these are to be used as medicines, and not for tonics or for constant drugging.

Liquorice, 2ozs.	} Powder and mix.
Ginger, 2ozs.	
Cayenne, 1oz.	
Aniseed, $\frac{1}{2}$ oz.	
Pimento, 2ozs.	
Sulphate of iron, 1oz.	

Give enough to make the food taste distinctly of it, or in emergency as much as will cover a sixpence, made into a pill with butter or a little meal.

The following may be used during cold wet weather, and is excellent for young turkeys under similar conditions. It may be given in the soft food.

Cassia bark, 1 $\frac{1}{2}$ oz.	} Powder and mix.
Ginger, 6ozs.	
Gentian, $\frac{1}{2}$ oz.	
Aniseed, $\frac{1}{2}$ oz.	
Carbonate of iron, 2 $\frac{1}{2}$ ozs.	

The next one is useful in preparing birds for exhibition, or getting them into condition after neglect, or in the case of a bird recovered from illness, and in poor condition. After the first week it may be varied by the addition of twice the quantity of good sugar.

Cascarilla bark, 2ozs.	} Powder and mix.
Aniseed, $\frac{1}{2}$ oz.	
Pimento, 1oz.	
Malt dust, 2ozs.	
Carbonate of iron, 1oz.	

It is better to have these powders made up by a chemist, and keep them in a well corked bottle. Remember, they are for urgent use, not for ordinary. Their use should not be relied upon to counteract the effects of neglect, and errors in feeding, &c. All the above may be added to the soft food so as to give a characteristic taste. In urgent cases use double quantities, or give a pill twice a day containing as much of the powder as will lie on a sixpence.

OVER-FEEDING, although not a disease in itself, is the primary cause of much sickness and disaster. Accumulations of internal fat do not permit due action of many of the organs, owing to the space being limited. As a general rule when fat takes the place of muscle the general powers are weakened, especially those of respiration, and organic mischief arises. Disease of the egg-producing organs and rupture of the oviduct are frequently associated with overfat condition and internal accumulations of fat. The liver becomes affected and morbid; changes in the kidneys and alimentary canal occur; while what are known as miasmatic diseases are due to the non-elimination of the nitrogenous elements which have accumulated in the blood through over-feeding with such products. Change of diet is to be recommended, as a never varying diet, however good the proportions may be, soon palls, and the birds get in a stale condition. The fowl is omnivorous to a great extent, and this should be remembered. Many complain that their birds will not eat oats or barley. If they are hungry they will soon do so. I never have any trouble in changing the bill of fare. If I give oats the birds eat them or go empty. A hard and fast rule as to quantities of food cannot be laid down. As much as will be readily eaten is the general dictum. Some birds will readily eat twice as much as is good for them. If the birds are laying well they can have this quantity; but if not, either they are starved or they are too well fed. Examine the birds, and if very plump and heavy, decrease the quantity of food—if poor, give more and in variety, and as a rule the eggs will increase. Always remember, over-feeding is not good feeding.

SORGHUM PASTURE FOR DAIRY COWS.

The following press bulletin from Department of Dairy Husbandry, issued by the Experiment Station, Manhattan, Kansas, August 13, 1901, is of value:—

During the month of July the Kansas Experiment Station realised \$8.20 per acre from pasturing sorghum, besides having the field left to produce a second crop. On July 1 twenty-seven milch cows were given all the alfalfa hay they would eat and then turned into a sorghum field of 6.7 acres for 15min. The sorghum was from 18in. to 24in. high. The next day they remained 30min, the third day 45min., and so on, increasing 15min. daily until they reached 1hr. 30min., when they were left to run at will. During this transition period the cows were given all the alfalfa hay needed to keep up the normal flow of milk. For the first nine days this amounted to nearly 24lbs. daily per head. After twelve days the cows were allowed to pasture the sorghum at night as well as during the day. For the rest of the month these cows consumed less than 5lbs. of alfalfa hay daily per head.

If it had not been for the sorghum pasture it would have required at least 24lbs. of alfalfa hay daily per head to keep these cows up to a good flow of milk. This would have amounted to 10 tons. As it was the cows consumed only $4\frac{1}{2}$ tons, making a saving of $5\frac{1}{2}$ tons. At \$10 per ton (a low price for this year) this would amount to \$55, which, divided between 6.7 acres, would amount to a saving in alfalfa consumed of \$8.20 per acre.

On August 1 the cows were turned into a fresh field of sorghum from 3ft. 6in. to 5ft. high, but with the same precautions as were exercised July 1. This time it did not take as long to get them on full feed, and after the first week they had free access to the sorghum day and night. The two fields of sorghum are connected with each other and the cows not only have access to both fields, but in getting to the second field are obliged to pass through the first, where second-growth sorghum is making a vigorous start after the recent rains. Up to the present writing (August 13) the herd has not experienced the least particle of trouble from poison or even bloating.

During the time the Kansas Station has been pasturing sorghum several reports have been received of cattle dying in ten or fifteen minutes from the time they entered the sorghum patch, but in every case where we have been able to get the details, the cattle have eaten the sorghum on empty or nearly empty stomachs. Cattle should have their stomachs so well filled that they feel completely satisfied before touching the green sorghum, and then allowed to eat only a few minutes at a time until they are accustomed to it. If sorghum can be pastured successfully, as has been done by the Kansas Experiment Station, it means that the dairymen and stockmen can get an immense amount of pasture from a small area, which is available at a time when their other pastures are getting short and dry. Pasturing will also be the most economical way of utilising sorghum. The man that turns his cattle in a sorghum field, however, must realise that he may be taking risks. He must weigh the evidence for and against its use and then decide for himself whether the benefits will outweigh the risks.

THE WORLD'S WHEAT CROPS, 1900.

In the *New South Wales Agricultural Gazette* for August the following figures are given concerning the wheat crop of various countries for 1900:—

New South Wales, 1,530,609 acres produced 16,173,771bush., being an average of 10.56bush. to the acre.

The Board of Agriculture (Great Britain) returns for 1900 show that in Great Britain the area under wheat was 1,808,863 acres, which yielded an average of 28.61bush., which was a good deal lower than the mean of previous years, 31.31bush.

In Argentine the area under wheat was 7,904,000 acres, yielded an average of 12.80bush., the mean for previous years being 13.98bush.

In Australasia the area under wheat was 5,884,116 acres, which yielded an average of 8.24bush., the mean for previous years being 7.83bush.

For Austria the average was 15.40bush., and mean for previous years, 16.30bush.

In Belgium the average was 26.04bush., the mean for previous years being 28.10bush.

In Canada—Ontario and Manitoba—the area under wheat was 2,902,941 acres, which produced an average of 14.66bush. per acre, the mean for previous years being 18.45bush.

In France the area under wheat was 16,642,800 acres, which yielded an average of 18·01bush., the mean for previous years being 18·90bush.

In Germany the 5,844,986 acres under wheat produced an average of 27·07bush., the mean for previous years being 24·17bush.

India had the enormous area of 17,437,646 acres under wheat, which produced an average of 10·47bush., the mean for previous years being 9·65bush.

Roumania's 3,927,251 acres produced an average of 13·93bush., the mean for previous years being 13·36bush.

In the United States of America the 42,495,385 acres of wheat produced an average of 11·91bush., the mean of previous years being 13·4bush.

Victoria — Area under wheat last season was 2,011,428 acres; yield 17,790,576bush. Average 8·84bush. per acre. Average for ten years—1890 to 1899—9·95bush.

South Australia.—Average for ten years—1890 to 1899—4·69bush.

New Zealand.—31·81bush. per acre; for ten previous years 24·61bush.

Queensland.—Average for ten years—1890 to 1899—was 15·53bush.

The fact that in several of the countries referred to the average yield for 1900 was considerably below the mean of previous years is rather remarkable.

With South Australia and Queensland so close at hand, and the figures to be obtained for the asking, it was rather unkind of the New South Wales statistician to simply quote the averages for ten years. The figures for South Australia for last year's crop are—Area sown, 1,913,247 acres; area reaped for wheat, 1,574,017; average yield reaped, 7·15bush. per acre. This shows an increase of 2·51bush. per acre over the previous year.

THE POISONOUS CAPE TULIP.

In connection with the existence of a large area of *Homeria collina* (Cape tulip) near Yankalilla the following report from the *Australasian Veterinary Journal* will be of great interest:—

SERIOUS MORTALITY AMONGST COWS THROUGH EATING A POISONOUS WEED.

By HECTOR G. J. RUNTING, G.M.V.C.

One morning early I was called to a farm in Coburg to attend some cows which had been poisoned by eating a grass or weed commonly known as the "Cape tulip." Upon visiting the farm one glance was sufficient to prove that the poison was very fatal, as dead cows were strewn in all directions and many others lying about in a very bad way, some of which died within half an hour of my arrival, whilst others seemed to have apparently little or nothing wrong with them; but closer examination proved them to be also on the long list of poisoned, and before long some of them had also joined their companions in the happy hunting ground. Altogether there were twenty-five or twenty-six cows poisoned, fourteen of which proved fatal.

The symptoms were not well marked. In many cases the animal would be lying quietly down in the natural way, and beyond a dry nose and suspension of rumination there was nothing else to be seen until an attempt was made to rouse the animal up, when it was at once seen that paralysis was present. Some of the cows would get on to their feet by hard fighting, stagger a few steps and fall again, but many others were quite unable to do even that much, and in every case the paralysis seemed to affect the hind quarters more than the fore. Temperature and respirations were normal, pulse weak, nose dry, and eyes wild and staring. There appeared to be no pain until within a very short time before death, when the latter put an end to all suffering. In the cases that proved fatal I noticed that no faeces had been passed, but in those that recovered the faeces voided were very dark and watery, and the greater the amount of diarrhoea present the quicker the recovery. In every case the cows were in a wretchedly poor condition, and therefore little wonder that the mortality was so great.

Upon *post mortem* the organs seemed to be sound and healthy, the trouble being confined to the digestive tract. Perhaps the brain and spinal cord would have shown some departure from

the normal, but, having a lot to do in trying to save the cows still alive, I had not the time to examine these parts. Not one case before death showed the least sign of tympanitis, but after death the carcass very soon became swollen, and a wonderful amount of fluid escaped from the rumen per nose and mouth, the fluid being of a dirty, dark, watery nature, much of which was found in the rumen upon opening. In each case the rumen was full of the noxious weeds, which extended to the third stomach, or omasum, the latter being in a healthy condition and full of a dark-colored matter similar to that found in the rumen and fairly fluid. The grass seemed to pass no further than the third stomach, but it gave off a dark, blackish fluid, which passed along the intestines, staining such parts black; in one case half the intestines were quite black, and further on were spotted with small black round spots.

Treatment.—Being unable to obtain any oil, which I believe would prove fairly beneficial if taken in time, I was obliged to try other remedies. Hypodermic injections of strychnine were tried to overcome the paralysis, and the galvanic battery was tried with the same purpose, but the result was far from satisfactory. I tried hypodermic injections of eserine to cause purgation, but had no result; then a combination of eserine, veratrine, and pilocarpine, also with no result. In some of the favorable cases drenches of salts and treacle were given, which appeared to act well, and in some instances repeated doses of milk and tincture of opium were given, with apparently satisfactory results; but at the same time I do not feel inclined to give such drenching much credit, and I put the recoveries down to the fact that such animals had not eaten a sufficient quantity of the weed to kill. One cow did not walk more than 50 yds. away from where she was feeding before she fell dead.

The botanical name of the plant is *Homeria collina*, and more commonly known as the Cape tulip.

The poisonous nature of the plant has been known in the district for some years, but some of the farmers allow their cattle to run on it daily, and, providing the cow is in fair condition, with a fair amount of food already in the rumen, she does not take readily to the weed at all, or the little she eats has no bad effect; but if cows are in very poor condition and hungry, such as those were, then the result, as just proved, is most disastrous.

I can find no record of the poisonous principle of this plant, nor of its physiological action. Its poisonous action is evidently upon the cerebro-spinal system, but there is room for careful investigation on the subject.

The existence of this weed in small patches in the Yankalilla district was brought under the notice of the Bureau many years ago, and several recommendations were made to have it brought under the provisions of the Noxious Weeds Act before it spread far. Unfortunately the desired action has not been taken, and now the weed occupies considerable areas of land in the locality in question, and has already been responsible for some losses of stock, besides occupying much good land to the exclusion of pasture grasses. The weed has also been reported from other localities during recent years.

THE LOCUST PLAGUE AND ITS SUPPRESSION.

(From "Imperial Institute Journal.")

Dr. C. F. Harford-Battersby, principal of Livingstone College, presided, on the 25th March, at a lecture delivered at the institute by Dr. A. Munro, entitled "The Locust Plague and its Suppression." With regard to the locust plague, he understood that Dr. Munro, who was an authority on the subject and had recently written a book entitled "The Locust Plague and its Suppression," had made a special study of the insect in South Africa, anything connected with which must be of interest at the present time now that we were looking forward to a peaceful settlement of the country. The audience would probably be presently better able to appreciate the extent to which the plague had interfered with farming operations in South Africa, and consequently to recognise the importance of anything that would tend to suppress the insect, and thus make things easier for colonists to settle down after the conclusion of the war.

Dr. Munro said that although few people in this country had seen a locust, as the insect rarely visited Great Britain and never came in large numbers or stayed any length of time, yet his subject was not without importance when one considered the large amount of damage locusts had even recently done, and

were still doing, in many places, and that the plague was always to be found in some part or other of the world. Thus locusts had existed as a plague—that is, in sufficient numbers to do appreciable damage to vegetation—for the last ten years in the southern republics of South America, and had there caused so much devastation that many new and thriving townships had become deserted and dismantled. The plague had raged for an equally long period in North Africa, where, in Algiers, a large number of the French regular troops had been employed in attempting to exterminate the insects. In South Africa, where, although so little of the country was under cultivation, great damage had been done. The plague also existed in Northern India and the West Indian Islands, in which latter district the pecuniary loss arising from locusts had been estimated at not less than £1,000,000 per annum for the last ten years. In four of the Western States of America there had been, from the same cause, an actual direct loss in one year of £40,000,000; and during visitations of four successive years an annual loss of £10,000,000 had been sustained.

Cyprus, until recently, had been (for about 250 years) devastated by the insect, and although once one of the most fertile and prosperous of regions, had by them been brought into absolute decay. The deplorable condition of the island when it passed into our hands in 1878 was well known. For four years the British Government had, at a great expenditure of money and energy, set themselves to the task of checking the plague, following the old methods of the Turks and Latin races of collecting the eggs of the insect; but all these efforts had proved unavailing. The screen-and-trap method (described later on in the lecture) had been adopted, by which in one year the pest had been practically exterminated, with the result that Cyprus, instead of being a loss to the Empire was now a profit, and the happiness of the people and the progress and prosperity of the island assured. It had thus been demonstrated that the locust plague could be suppressed by purely artificial methods, and Dr. Munro contended that if locusts were destroyed in other parts of the Empire, and proper attention paid to the question of irrigation, all the food its countries required could be supplied by them instead of their dependence very largely upon other sources.

The lecturer had first become acquainted with the locust in 1890, while travelling in Argentina, since which time he had made a close study of the insect. In 1896 he had gone to South Africa, and found that the locusts there, in their habits and essential characteristics, were identical with those of South America. The technical name for the insect he was describing was *Locusta migratoria*. It had its permanent homes—regions from which it was never entirely absent—such as the borders of the Mediterranean, limited parts of India, Central China, Central and Southern Africa, certain parts of the United States—near the Rocky Mountains, and some parts of both South America and Australasia. Its temporary homes, places to which it occasionally migrated, existed more or less all over the world where the climate was sufficiently warm and otherwise suitable.

Although not confined to any one country, the plague was particularly the pest of the farmers of India and South Africa, where the sirocco, or hot winds, facilitated the hatching of the eggs. The precise influences which determined the migration of locusts from their permanent homes had not yet been accurately ascertained; it was a matter of dispute, indeed, whether the life of the individual insect was about six months or whether it found its way to the permanent home of its flock at the end of the year, and there remained dormant until the next migrating season.

Locusts made their appearance in their temporary homes in large bodies, or swarms, and in this stage were known as wandering companies of fliers. Their

numbers were sometimes so numerous that a swarm, seen at about seven or ten miles distant, appeared as clouds in the atmosphere. The size of one of these clouds had been carefully estimated at forty miles in length and 300yds. in depth, and as containing at least 169 billions of locusts. There seemed to be no fixed time for the insects to commence their peregrinations to their temporary homes. They generally travelled at a height of from 40ft. to 400ft. from the ground, and sometimes at the rate of twelve miles an hour. They had no leader, although they all moved together. Their flight generally lasted about six weeks. They rested during the night, and the distances they traversed during the day varied very much: sometimes, on cold dull days, they did not rise or move from their encampments.

Flying locusts eat when they settle down during the day-time, and do not then, as "fliers," effect so much damage as when in the "hopper" stage.

At the end of the six weeks the company began to settle down, and a detailed and interesting description was given of the method the female locust adopted in digging small cavities in the ground, about 3in. deep and rather bigger than her own body, in which she deposited her eggs, usually about eighty in number. These cavities, or nests, were generally close together, and, under ordinary conditions, about 64,000 larval locusts would be produced in one square yard of earth. The fate of the parent locusts after the nesting period had been completed was still a matter of some conjecture.

The eggs took about forty days to mature, an operation which was practically simultaneous. From its exit out of the egg until it assumed the form of being a fully fledged "flier" a period of from about seven to eight weeks elapsed; and this was the time during which the insect did the most damage. For the first three or four weeks of their existence the young locusts kept in the neighborhood of their birthplace, then they developed a desire to explore, and the whole company moved off in a body in one direction. The insects spread themselves over the land, eating everything that came in their way, scarcely anything coming amiss to their ravenous appetites when sufficiently famished. In this, the "hopper" stage, they were called "the army on the march," and they travelled in a straight line irrespective of danger, being not easily turned from their course, and they were so closely phalanxed that nothing usually escaped them. The sight of this army was, said Dr. Munro, a very impressive one, and once seen would never be forgotten. Their food preferences determined their line of route, and the army could move about a mile a day, beginning with the heat of the morning sun, about 8 o'clock, and proceeding until near sunset; on cold and sunless days they remained stationary.

The most interesting portion of the lecture was that describing the various methods which had been adopted for the suppression of the plague. The numerous slides Dr. Munro threw upon the screen included the two following tables:—

NATURAL AGENCIES TENDING TO CHECK OR ABATE THE PLAGUE.

- | | |
|-----|---|
| (1) | Destruction by the wind, or hurricane dashing them into the ocean |
| (2) | “ birds. |
| (3) | “ reptiles, lizards (iguanas), toads. |
| (4) | “ mammals and fish. |
| (5) | “ wasps. |
| (6) | “ disease. |
| | (a) Internal larvæ or maggots from the <i>Tachina</i> fly. |
| | (b) <i>Mylabris</i> parasite. |
| | (c) <i>Mermis</i> parasite. |
| | (d) <i>Cynomia pictifacies</i> parasite. |
| | (e) <i>Empusa grylli</i> parasite. |
| | (f) Various—mites, &c. |
| (7) | “ of the eggs by insects, animals, weather, water. |

PRESENT ARTIFICIAL MEANS OF COMBATING THE LOCUST PLAGUE.

*I. Ingenuity or Finessing.**II. Destruction of the Eggs.*

- | | |
|---|--------------------------|
| (1) Machines—ploughs, harrows,
grubbers. | (4) Irrigation. |
| (2) Eating by pigs. | (5) Chemicals. |
| (3) Tramping the ground. | (6) Collecting the eggs. |

III. Destruction of Hoppers, Saltonus, Voelyangers.

- | | |
|---------------------------|----------------|
| (1) Maiming. | (6) Trapping. |
| (2) Tramping with stock. | (7) Burning. |
| (3) Crushing. | (8) Chemicals. |
| (4) Diverting. | (9) Fungi. |
| (5) Catching and bagging. | |

IV. Destruction of the Winged or Fully-fledged Locusts—Voladorus.

- | | |
|------------------------|---------------------------|
| (1) Diverting a flock. | (6) Crushing. |
| (2) Shooting. | (7) Burning. |
| (3) Maiming. | (8) Catching and bagging. |
| (4) Chemicals. | (9) Fungi. |
| (5) Tramping. | |

Ingenuity or finessing had reference generally to the kind of crops grown, and the time of sowing, in countries likely to be visited by locusts.

For destroying "the army on the march"—that was, the insect in its hopper stage—Dr. Munro advocated crushing by means of rollers as perhaps the most effectual method of getting rid of the pest, and he described a special kind of roller invented for this purpose so constructed as to be pushed and not drawn by a horse. With regard to "fliers," the method of destruction that at the present time was attracting the most attention was by fungi—notably the *Empusa grylli*, which was being artificially produced by means of breeding cages, and then sent in tubes to districts infested by locusts. These tubes were broken, and their contents distributed in various ways, with the result that the insects which became infected not only flew away and died, but after death became centres of contamination for others. This method, however, had not yet been sufficiently perfected to justify its sole adoption for the suppression of the plague; for instance, the fungi at present were inoperative unless the climatic conditions were favorable.

Dr. Munro's set of slides was most complete and interesting, and the vote of thanks proposed by the chairman at the conclusion of the lecture was cordially assented to.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Company report :—

September 28, 1901.

Again it is pleasing to report that exceptionally favorable weather conditions have prevailed during the month, so that the outlook has much improved, and we can with more confidence speak of the season's prospects. It is yet too early to venture even a guess at what the wheat yield is likely to be, but it is safe to say that in the moister districts a fair harvest may be expected, and that though the crops are very late in the drier portions of the State, excellent growth has been made during the past few weeks, and farmers there are now very hopeful. Following the fine rains of August, the first fortnight of September was warm and dry, giving vegetation the good show it needed in this late season. A change to moister conditions again set in after the middle of the month and continued for about ten days; and, as the rains were general, fresh impetus was given to the growth of vegetation. Cheering reports are coming in from all portions, outside pastoral districts as well as agricultural centres having benefited. Dams and tanks nearly everywhere are well filled.

Trade is generally healthy, both in town and country. The opening local wool sales for the season showed a marked advance in value of this staple. Other produce also well maintains, and though the copper market has fallen away a bit and the future seems somewhat uncertain, mining for this metal is being vigorously prosecuted. The new goldfields in Tarcoola district continue to attract attention, though developments in such a far outlying district, it is argued, must necessarily be very slow.

In breadstuffs a dragging month has been experienced, and the quotation for wheat 28s. 3d. off coast U.K.—of last month may be repeated, though a sale on this basis is reported during the past few days at 28s. 9d. for a cargo now loading at Melbourne. Below average yields in several European countries is not a strong enough factor apparently to cause any advance in price in face of the abundant American harvest, and the outlook does not favor the hope of higher values ruling in the near future, though Australian markets keep steady. The flour trade continues rather quiet. Millers' offal has been weaker, but forage lines generally maintain, it being expected that such as feeding grains will improve on Adelaide present quotations when the new tariff, looked for within a few days, is submitted, as Melbourne values are now much higher than ours.

The market has been chiefly supplied with New Zealand potatoes, some small consignments of Tasmanians and a few odd trucks from Mount Gambier District filling up the total demands. New locals are beginning to appear in this market, but yet in too small quantities to affect prices, though the season for old tubers here has practically closed. The extreme quotations ruling for onions during this year has attracted shipments from California, Japan, and the Mediterranean, resulting in a recent easing in values here, though price is still high enough to materially restrict the consumption.

The seasonable increase in milk supplies has been slow, so that shipments of butter to Europe from this part are not yet commenced, and unless unusually favorable weather conditions prevail the season must be very short, as last year this State ceased to be self-supplying before Christmas, and the depleted herds resulting from the prolonged drought have unfortunately not been restored. Values have eased down to export level, and with slight fluctuations may be expected to continue at about present rates whilst the small surplus beyond local wants is available. Eggs quickly rebounded from the price ruling when last we reported, and as buyers for preserving are operating strongly, and good export demand exists, we probably may not see lower rates in this line, at least whilst the cool season lasts. New local cheese is coming forward more freely and sells at high rates, but may be expected to ease down a couple of pence when the new tariff comes into operation. New Zealand has been chiefly supplying our wants, but is being steadily ousted by the increasing local supplies. Bacon further advanced, but the highest rate touched could evidently not be sustained, as a slight easing back is now showing, and there appears some uncertainty as to how inter-State free trade may affect this line. A fair turnover has been doing in honey, and values are a shade firmer. Beeswax continues scarce. The supply of almonds is very short of trade requirements.

September usually shows a falling off in the carcass trade, owing to the setting in of warmer weather conditions, but the decrease this season has not been so marked as ordinarily, the satisfactory high prices averaged giving consignors encouragement to continue forwarding later, though the season may now be reckoned as about closed. Up to 6½d. per pound for bright shop porkers, to 5½d. for good baconers, and to 4½d. for well fed veal was obtained at several sales during the month; but values have eased back fully 1d. a pound during past week, chiefly owing to sultry weather conditions. The market for poultry has been very satisfactory, and strong export and local demand gives the assurance of high prices at least up till Christmas time. Heavy catalogues have been met by large attendances of keen buyers at the regular auction sales throughout the month.

MARKET QUOTATIONS OF THE DAY.

Wheat.—Port Adelaide shipping parcels, 2s. 9½d. to 2s. 10d.; farmers' lots, 2s. 9d. to 2s. 9½d. per bushel of 60lbs.

Flour.—City brands, £8 5s. to £6 10s.; country, £6 to £6 2s. 6d. per ton of 2,000lbs.

Bran and Pollard.—9½d. to 9¾d. per bushel of 20lbs.

Oats.—Local Algerian and dun, 2s. to 2s. 3d.; prime stout feeding white, 2s. 6d. to 2s. 9d. per bushel of 40lbs.

Barley.—Malting, 3s. to 3s. 6d.; Cape, nominal at 2s. 6d. per bushel of 60lbs.

Chaff.—£3 7s. 6d. to £3 10s. per ton of 2,240lbs., bags in, dumped, f.o.b., Port Adelaide.

Potatoes.—Tasmanians, £8 5s. to £8 16s.; New Zealand, £8 to £8 5s. per 2,240lbs.

Onions.—£10 to £11 per 2,240lbs.

Butter.—Creamery and factory prints, 9½d. to 10½d.; private separator and best dairy, 8½d. to 9½d.; good store and collectors', 8d. to 8½d.

Cheese.—South Australian factory, 8½d. to 9½d.; New Zealand, 9½d. per pound.

Bacon.—Factory-cured sides, 8d.; farm lots, 7d. to 7½d. per pound.

Ham.—South Australian factory, 8d. to 9d. per pound.

Eggs.—Loose, 6½d. ; in casks, f.o.b., 7½d. per dozen.

Lard.—In bladders, 8d. ; tins, 7d. per pound

Honey.—2½d. for best extracted, in 60lb. tins ; beeswax, 1s. 2d. per pound.

Almonds.—Soft shells, 6d. ; kernels, 1s. 2d. per pound.

Live Poultry.—Medium to fair hens and light cockerels, 1s. 10d. to 2s. 3d. each ; heavy weight table roosters, 2s. 5d. to 2s. 11d. each ; ducks worth 2s. 1d. to 2s. 6d. ; geese, 3s. 3d. to 4s. ; pigeons, 9½d. ; turkeys from 5½d. to 7d. per pound live weight for ordinary to good table birds.

Carcass Meat.—Nice shop porkers, 4½d. to 5½d. ; poor, dull and medium, 3d. to 4d. ; good baconers, 4½d. to 4¾d. ; vealers, from 1d. for medium to 2½d. for good quality.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, flour, and forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of September, 1901:—

Adelaide	1.48	Manoora	2.31	Macclesfield	3.75
Hawker	1.18	Hoyleton	1.72	Meadows	4.84
Cradock	1.54	Balaklava	1.89	Strathalbyn	2.66
Wilson	1.08	Port Wakefield	1.22	Callington	1.07
Gordon	0.89	Saddleworth	2.31	Langhorne's Bridge..	1.20
Quorn	0.97	Marrabel	2.08	Milang	0.66
Port Augusta	0.75	Riverton	2.86	Walleroo	1.80
Port Germein	0.71	Tarlee	2.22	Kadina	1.68
Port Pirie	1.10	Stockport	2.46	Moonta	1.61
Crystal Brook	1.11	Hamley Bridge	1.84	Green's Plains	1.57
Port Broughton	1.49	Kapunda	2.82	Maitland	2.38
Bute	1.60	Freeling	2.03	Ardrossan	1.64
Hammond	1.18	Stockwell	1.99	Port Victoria	2.50
Bruce	0.77	Nuriootpa	1.98	Curramulka	1.53
Wilmington	1.84	Angaston	1.60	Minlaton	1.89
Melrose	2.41	Tanunda	2.05	Stansbury	1.32
Booleroo Centre	1.87	Lyndoch	1.94	Warooka	1.96
Wirrabara	1.47	Mallala	2.06	Yorketown	1.83
Appila	1.55	Roseworthy	1.48	Edithburgh	1.29
Laura	1.91	Gawler	1.64	Fowler's Bay	0.77
Caltowie	1.41	Smithfield	1.18	Streaky Bay	1.22
Jamestown	1.41	Two Wells	1.22	Port Elliot	1.56
Gladstone	1.85	Virginia	1.24	Port Lincoln	1.83
Georgetown	1.67	Salisbury	1.14	Cowell	2.03
Narridy	1.71	Teatree Gully	2.33	Queenscliffe	1.55
Redhill	1.48	Magill	2.18	Port Elliot	2.74
Koolunga	1.38	Mitcham	2.05	Goolwa	1.64
Carrieton	1.49	Crafers	4.62	Meningie	1.42
Eurelia	1.15	Clarendon	2.94	Kingston	2.64
Johnburgh	1.58	Morphett Vale	1.56	Robe	2.16
Orroroo	1.43	Noarlunga	1.39	Beachport	2.77
Black Rock	1.26	Willunga	2.06	Coonalpyn	1.92
Petersburg	1.83	Aldinga	1.47	Bordertown	3.40
Yongala	1.95	Normanville	1.65	Wolsley	2.91
Terowie	1.35	Yankalilla	1.90	Frances	3.25
Yarcowie	1.16	Eudund	1.89	Naracoorte	3.49
Hallett	2.19	Turo	1.68	Lucindale	3.06
Mount Bryan	2.02	Mount Pleasant	2.87	Penola	3.25
Burra	2.39	Blumberg	3.83	Millicent	3.19
Snowtown	1.94	Gumeracha	3.73	Mount Gambier	4.11
Brinkworth	1.71	Lobethal	4.37	Wellington	1.13
Blyth	1.51	Woodside	3.71	Murray Bridge	1.01
Clare	2.56	Hahndorf	4.91	Mannum	0.91
Mintaro Central	2.42	Nairne	3.28	Morgan	0.85
Watervale	3.18	Mount Barker	3.93	Overland Corner	0.68
Auburn	2.69	Echunga	4.15	Renmark	0.86

WEATHER AND CROP REPORTS.

BAKARA (September 25).—Early in the month the weather was very hot and windy. Several nice showers have since fallen. The crops are coming into ear, but in many cases are not likely to be very high. Feed is backward, but stock are in good condition.

BALAKLAVA (September 24).—During the past week nice rains have fallen after a spell of hot dry weather. Crops sown on summer-ploughed land were feeling the weather more than on fallow. Some crops are well out in ear, but the majority will not be out for a fortnight yet. Feed is fairly plentiful, and stock are in good condition. Farmers are commencing to scarify early fallows which were commencing to look green. Crops are not likely to be so heavy as last year, and the hay crop will be fairly short.

BOOLEEROO SOUTH (September 18).—The past few weeks have been very trying for wheat crops. Good rains have, however, fallen of late, and the crops are recovered. If more rain falls soon the average yield will be good. Rainfall for month to date, 1·22in.

BURRA (September 21).—The crops are looking well although only short for this time of the year. Grass is backward. Rainfall for month, 2·08in.; for year to date, 12·83in.

CRYSTAL BROOK (September 26).—The weather for the past month has, on the whole, been all that could be desired for wheat crops. Grass has made good growth, and stock are thriving.

GAWLER RIVER.—The few extremely warm days were very trying for the crops. The showers which fell this week revived them considerably. With reasonable weather a very fair crop should be harvested. Feed is plentiful and stock are in good condition. Shearing will commence shortly.

KAPUNDA (September 26).—Crops have greatly improved during the month, and farmers expect to get an average crop of wheat; but an average crop of hay is doubtful. It all depends now on the weather during the next month. The grass is very backward, but is now growing rapidly. Stock are not looking so well as they did last year at this time.

LUCINDALE (September 25).—A month of good growing weather. Nice warm days with good rains at intervals. Feed and crops coming on rapidly. All stock looking well. Rainfall from August 27, 3·34in.

MALLALA (September 20).—Feed and crops have been improved by a good change in weather. With favorable weather continuing an average harvest will be reaped, but it will fall considerably short of last year's yield. The hay crop will be short.

MELROSE (September 26).—Feed is now plentiful, and the prospects for wheat crops are encouraging, and strong north winds and hot weather were experienced in early part of month, but subsequent rains have prevented any ill effects. Rainfall since August 26, 4·7in.

NANTAWARRA (September 23).—Stock are looking well, and feed is about at its best. Shearing is starting and lambs are ready for market; some good ones will be sent again this year, although they are not quite as heavy as last year. Rainfall for month to date, 2·06in.; for the year, 12·08in. A very severe week was experienced during show week, and it cut the wheat plants about badly, but the copious rains which followed have revived the crops.

ONOROO (September 20).—Very disagreeable weather was experienced during the early part of this month, but of late good rains have fallen accompanied with thunderstorms. The crops and feed are now making headway since the late rains. Young locusts have made appearance, but very small yet, and not in large numbers. Fallowing is the order of the day. Stock on the whole are improving in condition.

PETERABURGO (September 26).—Prospects for coming harvest are good, but locusts are reported to be numerous.

PINE FOREST (September 27).—The first three weeks of this month were very dry with strong winds, placing the crops in a low condition until rain came, which lasted for several days and totalled 2·32in. The crops now look splendid. Haymaking has commenced in some parts. Feed is abundant, and stock are in good condition. A few complete harvesters from Victoria will be tried this season, and it is expected that they will displace the use of the stripper in a few years.

PORT ELLIOT (September 21).—Splendid showers have fallen this month.

SADDLEWORTH (September 24).—The weather of the last week has been about perfect from a farmer's standpoint. The wheat has stood out well this season, and with the late welcome rains prospects are very bright. The rains have been steady and soaking, so that many dams are still low. Stock are improving. The absence of frost proves very favorable to growth of feed. Working of fallow and shearing are being prepared for. Prospects of a sorghum crop are now encouraging.

SCALES BAY (September 21).—The weather has been changeable, heavy rains falling in parts, some places receiving but little. Rainfall for month to date, 1·20in.

STANSBURY (September 28).—The early part of month was very dry and was seriously affecting crops, but good rains have since fallen and there are now prospects of good yields both of hay and wheat.

STRATHALBYN (September 27).—Splendid rains have fallen which have much benefited crops and grass.

WILMINGTON (September 26).—With the late rains the aspect of the country is wonderfully improved. A few weeks ago the outlook was dismal in the extreme, but now crops and grass are making rapid headway. With anything like a mild and moist October the result should equal some of the bright seasons. A very noticeable feature is the headway the fertilised crops are making. The unmanured crops have been at a standstill during the dry weather, whilst the fertilised have been going on all along and now give promise of an abundant harvest. Stock improving in condition and feed plentiful.

REPORTS BY BRANCHES.

Reeves Plains, August 30.

Present—Messrs. W. H. George (chair), J. G. Dawkins, H. Day, R. B. Jenkins, J. G. Folland, E. Hancock, M. Richter, J. J. McCord (Hon. Sec.), and five visitors.

JERSEY CATTLE.—Mr. J. G. Dawkins read a paper on this subject to the following effect:—

It has been wisely said it is a good thing to live in the country; to which might be added it is good to have a first rate cow. It is proved that cows of the Jersey breed rank first for richness of milk, for quantity and quality of butter. Until recently an impression prevailed that the cow of the Channel Islands was unfitted, by its apparently delicate appearance and breeding, for the use of persons who were unable to bestow on it the most assiduous care and attention; but a more intimate acquaintance with the animal has shown that this impression is without foundation, and we now constantly see the Jerseys thriving under circumstances that would be fitting for any other breed kept for milking and breeding. The Jersey cow will be found invaluable for family use from its docility and small consumption of food. The average for one year in a dairy of forty cows, under ordinary care and management, has been 10lbs. of butter for each cow per week, while in other dairies not more than 6lbs. to 7lbs. is produced from the ordinary cow. We have, therefore, in the breed under consideration the triple advantage of a symmetry of form, a docility which makes it quiet to handle—in most cases allowing the milkers to sit down and milk anywhere; also the bulls are quiet and tractable under proper care and management. Those we have used in our herd have been quiet; also the ordinary fence keeps them without the unsightly stick on their necks. The prejudice against the Jersey which has existed amongst dairy farmers, whose only object is profit, is also fast wearing away, there being scarcely one dairy in England that does not have a certain proportion of these cattle in the herd; experience having proved that the introduction of the Jersey in the proportion of one to six other cows has so improved the character of the butter that from 1d. to 2d. per lb. in advance is obtained in the market. The pre-eminent utility of the Jersey as a cross in breeding with the ordinary cow is universally allowed where the dairy is the object. The cow needed for the dairy cannot under any circumstances be selected for the qualities which will produce fat, the two natures are incompatible. To have the best meat we must get rid of any tendency to milk, and for milking purposes we obviate every disposition to fatten. We cannot have both qualities in the one animal, and attempts to do so will only end in disappointment. The sole office of the Jersey is to produce the largest possible amount of rich milk from a given amount of food. A large Ayrshire or Dutch cow, giving 4,000 quarts of milk during a part of the season and going entirely dry at another, will consume as much food as would support two Jerseys giving 2,000 quarts of much richer milk—one calving in the spring and one in the autumn. Where accommodation can be found for only one cow this breed is the best. Giving ten quarts at their flush, and not falling below three quarts within six weeks of the next calving, the cream increasing and becoming richer as the quantity of the milk decreases; thus maintaining a satisfactory quantity for at least ten months in the year. I will now give a few points on the choosing of a good cow. The head should be small and lengthy from the eye to the nose. The horns thin and open and not cramped, or as is frequently said, curly. The eye full, but not prominent; the latter quality indicating excitability and restlessness of disposition that is not favorable to milking. The ear lengthy and broad, and well-fringed with hair, indicating a strong constitution. A broad muzzle should be avoided, as showing a tendency to fat. The neck should be long, flat, and narrow, with a tendency to rise at the wither. Broad behind the arm to allow the full expansion of the lungs. The chest being deep, the flat-sided cow is more especially to be chosen as a milker. The hips should be wide, rugged, and high. The haunches wide and large, dropping slightly towards the tail. The thigh long and lean, with plenty of width, the veins being prominent. Small flat feet and thin tail. I now come to the udder (to which all former remarks are secondary), which should be free from hair, flexible and soft, with no tendency to flesh, the bag extending well forward, as level as possible with the belly, and high up between the

thighs. The feeding veins should be particularly observed. Fine bone, hair soft and thick. Let the teats be well apart, and large enough to fill the hand; and let us keep in mind that a large yielder must be well fed.

An interesting discussion, in which most of those present took part, ensued, the general opinion being that the Jersey and Jersey strains were the best for dairying. Mr. Folland thought the Jerseys rather delicate for their scrub country, but for a family cow they were unequalled. He did not agree with Mr. Dawkins as to the docility of the bulls, his experience being that they were more vicious than most other breeds. He also doubted whether they were any more proof against the disease known as "cripples." He found that a pound of Epsom salts, given directly the first signs of this complaint were apparent, had a very satisfactory effect. Mr. Jenkins had had considerable experience in Tasmania, and always found it cheaper to keep a good cow than a poor one. The Jersey was undoubtedly the cow for the milk bucket. The Hon. Secretary agreed with Mr. Dawkins' paper. He found also that the half-bred Jersey was as profitable as the pure bred, but it was no use going beyond the first cross, as the progeny seemed to deteriorate quickly. Mr. George said farmers usually made great mistakes in the treatment of their cows; any feed seemed to be considered good enough for the cow. If the cows were looked after as well as the average farm horse he was convinced the farmer would find it profitable, and would not have to bury so many animals. Mr. Dawkins considered that there would be no great improvement in our dairy herds until a tax was imposed on bulls: then no one would keep a useless mongrel, and there would soon be a change for the better. He advocated the milking of heifers to their full powers, so as to extend the milk veins, udder, and teats. It was a great mistake to follow the common practice of only milking the heifer for a short time. Mr. Dawkins showed a number of photographs of his Jersey cattle.

Meadows, September 2.

Present—Messrs. J. Catt (chair), W. J. Stone, G. Usher, T. Usher, T. B. Brooks, G. Rice, F. W. Dohnt, and D. D. Murphy (Hon. Sec.).

FARM MANAGEMENT.—Mr. T. Usher read a paper on "Stock and Management of a Small Farm in the Hills," as follows:—

It is well known that the small farmer of to-day must make the best use of his holding. He must not carry all his eggs in one basket, but should grow whatever will turn in most profit. Take, for instance, a farm of eighty acres. It should be well fenced and divided into three paddocks to be used in turn for grazing and cropping. Sufficient hay should be grown for the farm stock for at least eight months of the year, and the remainder of paddock could be put into peas, which usually pay well. On most farms in the South dairying is carried on, and there are flats and swamps that will grow potatoes, mangolds for pigs, and vegetables of all kinds; also green fodder for dairy cows. It will not pay, however, to grow fodder on good potato land, as potatoes at £4 10s. per ton will pay better than growing fodder for dairy cows. Enough should be grown to keep stock in health during the summer months. Oaten hay cut on the green side will produce as much milk as maize or sorghum, and sufficient for twelve or fourteen dairy cows should be grown. It is better to let a little go to waste or manure than to keep too many cows and half starve the whole herd; but of course the number to keep is simply a matter of judgment. In the favored parts of the district a herd of cows, well cared for and kept in good condition, with a little green fodder and hay or chaff during the summer and autumn months, and pastured on good grazing land with plenty of good clear water (have a trough if possible, as cows prefer spring water to running creek water), should make £8 10s. or £9 per head per annum, with milk at 4d. per gallon average for the year. Cows should be milked quickly and at regular hours, dividing the time as nearly as possible between each milking, and they should be treated gently. Cows can be milked to within two months of calving. When dry it is a great mistake to turn them away into back country and let them get low in condition. It is simply throwing away income for the next year. To keep up the herd the farmer will find it cheaper and better to raise stock on the farm than to go to the market for it. Keep a pure-bred bull of milking strain, and keep back two or three heifer calves every year to ensure

against old age and accidents. Ten days after birth separator milk can be fed to the calves; if boiled and a little salt added the calf will fatten on it. It is necessary to keep good all-round horses to work the farm. The farmer must keep a few pigs also; three breeding sows would be enough, as it pays the small farmer best to fatten the young ones and sell them at five months old. In this way he can add to income from the dairy very much, as there is nothing that will fatten pigs quicker than milk and pollard. Young pigs weaned at eight weeks old and fed well to keep them growing until they are three months could then be put up and finished off for market. Raw mangolds fed to store pigs in autumn and winter, when other food is scarce, will keep them growing and put on condition. The best breed to keep is the pig that fattens quickest in winter and spring on milk and pollard. Twelve bushels of pollard fed with separator milk, and a little grain early in the morning, should make a well-doing pig ready for market. It is best to scald pollard in winter. In the cold weather pigs should be kept clean and have good dry beds. On a small farm it is also very profitable to keep a few head of poultry—especially geese and ducks—having them ready to sell at Christmas time, as they are got up and fattened very quickly when the corn is about at that time.

A good discussion ensued, and it was agreed that mangolds were one of the most profitable crops to grow for stock-feeding in the Hills. Some members thought the number of cows proposed to be kept was rather large, but agreed that this depended entirely on the capabilities of each farm.

Koolunga, August 29.

Present—Messrs. T. B. Butcher (chair), J. Button, E. J. Shipway, J. Pengilly, R. Lawry, J. Sandow, J. Butterfield, Geo. Jose, J. C. Noack (Hon. Sec.), and one visitor.

CARE OF IMPLEMENTS.—Mr. Sandow advocated painting all implements periodically, even to the ironwork; also housing implements when not in use. He cited cases where he had seen harrows used as gates, a most dangerous practice. He did not advocate a smithy on the farm, as the ordinary farmer will often attempt jobs beyond his skill, and failure and waste are the result. Mr. Sandow's remarks received criticism from all present. Mr. Jose did not think it necessary to paint the ironwork. Mr. Lawry advocated red lead and oil in preference to paint on the woodwork, also that implements should be kept clean. Mr. Pengilly did not think sufficient care and attention was given to the harness. Mr. Button said there were many little jobs a farmer could do for himself if he has a smithy, though he should not attempt too much.

Mount Remarkable, August 29.

Present—Messrs. C. E. Jorgensen (chair), W. Lange, T. P. Yates, J. B. Murrell, J. McIntosh, T. H. Casley, and J. O'Connell (Hon. Sec.).

WHEAT EXPERIMENTS.—Mr. Lange reported on experiments with fertilisers which he was carrying out under the instructions of the Inspector of Fertilisers. Where the manures had been broadcasted on the ground three months before sowing the seed the crop was no better than on the unmanured land. The plot drilled in with super, at rate of $1\frac{1}{2}$ cwt. per acre was doing splendidly, and had left all the others far behind. The plot manured with the $1\frac{1}{2}$ cwt. of Thomas phosphate was better than the unmanured plot, but nothing like the previous plot. It was decided to pay a visit of inspection to Mr. Lange's plots in October.

QUESTION BOX.—It was decided to obtain a question box, and invite the public to submit inquiries.

STOCK COMPLAINTS.—Mr. Casley reported one of his horses suffering from a swelling on the rump which, on being lanced, discharged a large quantity of matter. He would like to know what was the cause. Mr. Jorgensen had a young horse severely attacked by strangles, but it was now recovering.

Brinkworth, August 30.

Present.—Messrs. A. L. McEwin (chair), S. Auger, J. F. Everett, C. Ottens, W. H. Pearce, A. W. Morrison, H. J. Shepherd, J. Cross, W. Welke, J. Stott (Hon. Sec.), and two visitors.

OFFICERS.—Feeling reference was made to the loss sustained in the death of Mr. Jas. Graham, Vice-chairman of the Branch. Mr. J. Cross was elected to fill the vacant position.

BREEDING HORSES.—Mr. Jas. Cross read a paper on this subject to the following effect:—

Farmers do not always exercise enough judgment in the breeding of horses. If we want good draught horses we must first improve our breeding stock. Our mares on the whole are a very poor lot—mostly without any pedigree. We must also be careful to get a pedigreed stallion with good points. It is due to carelessness that our horses are such a mixed lot. Too often the mare is used so long as she can rear a foal without apparently any attention being given to the likelihood of her producing a foal worth rearing. The farmer as a rule does not believe it takes any more feed to keep a mongrel in working order than a good pedigreed animal, but this is often the case. The latter will do more work on less feed, and look better. If the Government had taken more interest in this matter a few years back, and put a tax on unpedigreed stallions, there would have been a better class of horses generally in the State now. I favor a good heavy draught horse on the farm; you cannot breed them too heavy out of the class of horses we now have. It pays farmers better to breed good draughts than any other class, as they will always fetch fair value if sold. When starting to breed remount or carriage horses it will be found a more difficult task than is bargained for, though such horses will prove very profitable to successful breeders. I have seen some good horses of this type from a blood mare mated to a good draught entire. I do not believe in breeding from roadster stallions, one cross being quite enough. The quality of the hair is a good guide in the choice of a brood mare. If she is a mongrel it will show first in the hair. They should be as fine in the hair as possible, the head kindly, and wide between the eyes, broad in the chest, hindquarters good, and short in legs and cannon bone. You cannot expect the progeny of the best mares to be much good if the sire is a mongrel, neither expect a good foal if the mother is a mongrel. Most farmers seem to expect that a good horse must get good foals, and the horse is often blamed for what the mare is responsible for. If we breed two or three good foals each year instead of five or six mongrels we shall be working on better lines.

A long and interesting discussion ensued. Messrs. Everett and Shepherd agreed in the main with Mr. Cross. The latter did not see any reason why we should not breed as good horses here as in the other States, and favored the licensing of all stallions, whether kept for hire or not. Mr. Pearce preferred to let others breed the horses, and he would buy them when he wanted any. Mr. McEwin did not altogether agree with Mr. Cross; he had seen good stock from inferior horses. Messrs. Ottens and Welke agreed with the paper, but objected to the proposed tax on stallions. Mr. Cross insisted on the necessity for getting good stallions and breeding up all the time; it was no use breeding from a half-bred mare and a half-bred sire. Generally members were of opinion that it was best to breed from pedigree sires and mares.

Meningie, August 31.

Present.—Messrs. M. Linn (chair), Thos. Joy, W. J. Botten, S. F. Robinson, J. Williams, and H. B. Hackett (Hon. Sec.).

CONGRESS.—Members were of opinion that it would be better if the Congress agenda paper could be sent to each Branch at least two weeks before the meetings were held, in order that the delegates could ascertain the feelings of the Branch on the various matters to be discussed. [Only those who have had the privilege of arranging for a Congress of this character can appreciate what this would mean. What with the delays of the Branches in sending on papers and subjects for discussion, and the disappointments that occur after the paper is practically arranged, it is difficult to get the programme settled at all.—GEN. SEC.]

CREAM TEST.—Mr. Joy gave particulars of tests carried out during the past month with his cows. During fairly mild weather the returns were much higher than during cold weather, thus demonstrating that warmth was a great factor in the production of butter. Mr. Williams considered it necessary to keep the milk at a temperature of 55deg. to 60deg. F. for testing. Mr. Botten agreed as to the effect of temperature on cream; a sudden change to cold frosty weather had a marked effect.

Mount Pleasant, September 6.

Present—Messrs. G. Phillis (chair), J. F. Miller, P. Miller, jun., E. Miller, F. Thomson, and H. A. Giles (Hon. Sec.).

POTATOES.—Some discussion on growing potatoes took place. It was decided that experiments be carried out in planting at different times and in high and low ground. Generally too much wet or frosts have prevented profitable returns being obtained in this district.

Appila-Yarrowie, August 30.

Present—Messrs. P. Lawson (chair), A. Fox, J. Wilsdon, J. H. Bottrall, N. Hannagan, W. Stacey, J. Daly, J. H. Klemm, E. Catford, W. C. Francis, R. H. Grant, C. G. F. Bauer (Hon. Sec.), and two visitors.

FIELD TRIAL. It was decided to arrange for a field trial of cultivating implements.

COST OF WHEAT-GROWING.—The Hon. Secretary read from *Journal* papers read at Crystal Brook Branch on this subject, a 12bush. crop being taken as a basis. Most members were of opinion that the crop could not be put in and harvested under 19s. per acre. Mr. Stacey said it would cost all of 21s., while Mr. Lawson thinks it could be done for 12s. per acre. Some members were of opinion that, as fodder for stock, the stubble left on the field after stripping was worth 6d. per acre, while others valued it at half that amount. The Hon. Secretary considered the estimates given by Messrs. Pavy and Hamlyn fairly correct where wheat is the only source of income.

Onetree Hill, August 29.

Present—Messrs. J. Bowman (chair), F. Bowman, J. Flower, F. L. Ifould, M. G. Smith, J. Clucas (Hon. Sec.), and one visitor.

BEE-KEEPING.—Mr. F. Bowman read a paper on "Bee-keeping in conjunction with Agricultural Pursuits," to the following effect:—

The first point is the loss to this State through farmers not keeping bees to collect the nectar that goes to waste almost every year. A farmer that allows waste to go unchecked is not wise or economical. There is no farm where there is not some waste going on, but it is the duty of the farmer to allow as little as possible.

With honey it can be extracted and put in tins, soldered down, and stored away until there is a market for it. Honey will keep any length of time. Some object to keeping bees on account of the nuisance they are at the watering troughs, stinging the animals, &c. This can be avoided by giving the bees a trough of their own, and with care and attention they will not trouble man or beast. How many colonies will it pay a farmer to keep? I would say not less than twenty, because you require to get the latest improved bee-keeping appliances. Bee-keeping is a business that has to be learned, and it is of no use any person going into the business without plenty of patience and perseverance.

We find many parents send their sons into the towns to learn some trade, but I never knew of a boy being sent to learn bee-keeping, although there is money to be made out of it.

Mount Bryan East, September 9.

Present—Messrs. T. Wilks (chair), J. Wilks, A. Pohlner, W. Brice, W. Dare, B. H. Dunstan, J. Honan (Hon. Sec.), and two visitors.

HARROWING WHEAT CROPS.—Mr. Brice reported having harrowed portion of his crop when it was well up, and the difference between the harrowed portion and the rest of the crop was now very marked. The plants on the harrowed land had stooled out much better. He used blunt harrows, as he was of opinion that sharp harrows go in too deep and tear up the plants.

CROPPED v. VIRGIN LAND FOR GRAZING.—A discussion took place on the carrying capacity of land that had been cropped as compared with virgin land. The majority of the members were of opinion that, in this district, land that has not been broken up will carry more stock than land that has been cropped.

Johnsburg, August 24.

Present—Messrs. G. H. Dunn (chair), J. Sparks, W. Buchanan, F. W. Smith, W. McRitchie, L. Chalmers, F. W. Hombsch, and T. Johnson (Hon. Sec.).

HAND-FEEDING OF DAIRY CATTLE.—Considerable discussion took place on reading of article by the dairy instructor, Mr. G. S. Thomson, on the hand-feeding of dairy cattle.

HOLSTEIN CATTLE.—Members wished to know something about this breed of cattle [Particulars about Holstein cattle have been frequently published in this *Journal*. They are a large-framed breed of milking cows, and have for many centuries been reared in portions of Europe where the meadows are rich and stall-feeding is practised to a large extent. They are absolutely unfitted for a hot dry climate, where there is so little feed of a succulent nature — GEN. SEC.]

Lucindale, September 7.

Present—Messrs. E. Feuerheerdt (chair), B. A. Feuerheerdt, G. C. Newman, A. Carmichael, W. Dow, A. Matheson, J. McInnes, E. E. Dutton (Hon. Sec.), and four visitors.

DAIRYING.—The Hon. Secretary reported on condition of the Holstein bull Friesland. Several very nice heifer calves, black and black and white in color, had been dropped by cows served by the bull, and it was hoped they would prove good milkers.

IRREGULAR LAMBING.—Mr. Carmichael reported that about the 10th of May one of his ewes dropped a lamb, which was very weak, and only lived a few hours. About two months later this ewe gave birth to another lamb, which she was rearing. The Chairman said this was a very rare occurrence; it had been known to occur with other stock.

Belair, August 24.

Present—Messrs. O. Nootnagel (chair), G. Rossini, G. Wescombe, H. Halstead, J. Halstead, W. J. Bartlett, and G. R. Laffer (Hon. Sec.).

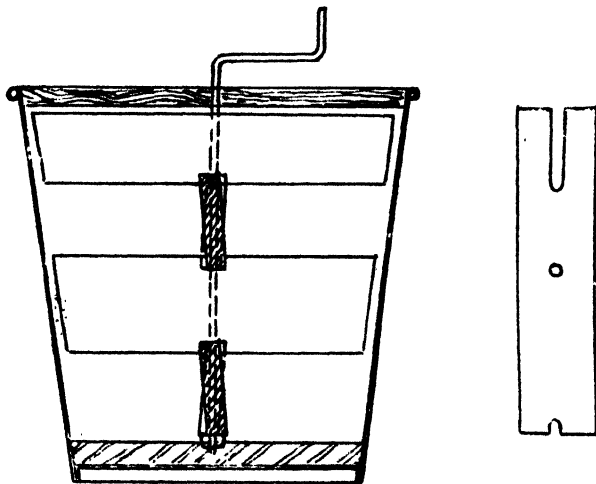
PEACH CUEL-LEAF.—Last season this disease was very prevalent throughout the district. A long discussion took place on the efficacy of spraying, and it was generally thought that the moist changeable weather was partially to blame for the extra severity of the attack, but that neglect to spray was the main

cause. Mr. Bartlett considered Bordeaux mixture a sure remedy if properly applied, and the Hon. Secretary agreed with this view. It was also pointed out that some varieties were very susceptible to the disease, amongst the worst being Elberta and Chinese Cling, while the early American sorts, such as Briggs' Red May, Hales' Early, High's Early Canada were but little affected.

Holder, August 31.

Present—Messrs. J. Rowe (chair), H. J. Rossiter, J. Green, H. Blizard, E. Jaesche, S. Pickering, J. Starr, H. Tuck, John J. Odgers (Hon. Sec.), and two visitors.

BUCKET CHURN.—Mr. F. Starr showed a small churn made by himself, and suitable for use where only one or two cows are kept. The annexed illustration shows a section of the churn and of the top stay:—



It consists of an ordinary bucket with a piece of board about 3in. wide slotted at each end to embrace the handle when laid across. A spindle descended through the centre to the bottom of the bucket, passing through four fans (similar to a child's windmill) set at right angles, thus \times . The lower edge of each fan was let into the upper edge of the one beneath, about $\frac{1}{4}$ in. A nut at the bottom of the spindle hold the fans tight. A handle on the top of the spindle completed the churn. The whole can be quickly taken apart for cleaning.

DAIRY COWS.—Members are agreed that attention to the comfort of dairy cows, keeping them warm by rugging during cold weather, affording them shelter against heat in summer, regularity in feeding, supply of pure water, &c., are greatly conducive to profit.

Arthurton, August 29.

Present—Messrs. W. H. Hawke (chair), W. Short, J. Koch, W. E. Hawke, S. T. Lamshed, J. B. Rowe, H. Baldoch, and C. L. Palm (Hon. Sec.).

FARMYARD MANURE.—Mr. J. B. Rowe referred to a paragraph in the *Journal* recommending a pit for storing manure for several years before using. [Such a recommendation should never have been published. A midden, or pit,

may be all right, but the sooner manure is covered up in the soil the more good will it do—provided it is not full of seeds of weeds.—**GEN. SEC.**] The Chairman had tried several methods, and found that the trouble of sinking the pit, carting the manure in and out did not pay for the labor. He favored using manure when fallowing, or spreading it on the grass paddocks if too late for fallow. Whatever weeds may afterwards appear can be killed when working the fallow. Members agreed that it is no desirable to give heavy dressings of farmyard manure on land to be cropped with cereals.

ANNUAL REPORT.—During the year eight meetings took place—five at homesteads and three in the Chairman's schoolroom, with an average attendance of nine members and nearly three visitors. Last year there were only twelve members on the roll, but this year there were fifteen. Many useful and practical subjects have been brought under notice, and instructive discussions have taken place, and four very practical papers were read and fully discussed.

Kanmantoo, August 29.

Present—Messrs. J. Downing (chair), E. Downing, R. Downing, W. G. Mills, F. Hair, Thos. Hawthorne, F. Lehmann (Hon. Sec.), and one visitor.

TRUE TAGOASTE.—Mr. Mills reported favorably of this plant (*Cytisus palmensis*). He had fed some of the branches to sheep, and they ate it all. The plant is growing splendidly, and is now flowering. He did not, however, see any difference between this plant and the one sent out several years ago, *C. proliferus*. Mr. Downing said he could see no difference between the two plants.

HARROWING WHEAT CROPS.—Mr. Mills stated that on one occasion he harrowed a piece of Steinwedel wheat lengthways and across. He was afraid afterwards that this would be too much for the crop, but he reaped 30bush. per acre. Mr. Hair mentioned that this season much of the wheat had failed to come through, owing to the surface of the soil being caked. He thought harrowing would have proved beneficial.

Millicent, August 29.

Present—Messrs. H. F. Holzgreffe (chair), H. Hart, H. A. Stewart, H. Oberlander, R. Campbell, W. J. Whennen, S. J. Stuckey, A. McRostic, and E. J. Harris (Hon. Sec.).

THE LIBRARY.—Hon. Secretary reported receipt of Part III. of "Injurious Insects," by C. French, and Bailey's "Book of the Nursery." It was resolved to purchase a work on "Education of the Horse."

AUSTRALIA FELIX.—Mr. Stuckey, who has just returned from a trip to Sydney, congratulated members on having fixed upon the south-east of South Australia for residence. He had seen much of New South Wales and Victoria, but very greatly preferred his own country and neighborhood.

WORMS IN PIGS.—Mr. R. Campbell had lost a number of pigs. The small gut at one part was completely closed with large worms, and the larger intestines were filled with smaller worms, about 1in. long. The pigs became poor, pot-bellied, with dry ragged coats and drooping ears. Sulphate of iron in liberal doses had no effect. Then 4ozs. of tobacco were boiled in 1gall. of water with 4ozs. soap. Of this decoction a cupfull was mixed with the feed for ten to fifteen weaners every second day, when they soon improved, and now appear to be quite cured.

Mannum, September 6.

Present—Messrs. A. Faehrmann (chair), J. W. Walker, J. L. Scott, R. P. Scott, F. W. Kowald, and W. H. Quartly (Hon. Sec.).

INVENTOR OF THE STUMP-JUMP PLOUGH.—The committee of the C. H. Smith Memorial wrote asking co-operation in the effort to raise a monument to the memory of the manufacturer of the first stump-jump plough, and members agreed to the request.

Lyrup, September 3.

Present—Messrs. P. Brown (chair), D. Thayne, D. J. Tree, A. Pomeroy, A. Menzies, and T. Nolan (Hon. Sec.).

ROCK PHOSPHATES.—Mr. Lewis forwarded samples of rock phosphate obtained from Adelaide. Members are of opinion that similar rock exists on the river. [Nearly every piece of limestone appears to be like rock phosphate. Try burning the samples, and if they do *not* break down into dust they *may* be worth analysing for phosphoric acid.—GEN. SEC.]

SALTBUSH.—Mr. Lewis said of four species of saltbush received from Central Bureau, only two germinated. *Atriplex vesicarium* grew fairly well, and now has a few seeds forming. About a dozen plants of *A. nummularium* grew and have done well. Pigs eat it. The latter should be a good stand-by when feed is absent.

Kapunda, September 7.

Present—Messrs. W. Flavel (chair), J. J. O'Sullivan, J. O'Dea, G. Teagle, J. H. Pascoe, C. E. Weckert, J. A. Schultz, Peter Kerin, B. R. Banyer, and G. Harris (Hon. Sec.).

ANNUAL REPORT.—The Branch pays rent of £1 per year, in advance, for use of a room for meetings in the School of Mines. There were eleven meetings during the year, with an excellent average attendance. Six interesting and instructive papers were read and discussed.

OFFICERS.—Retiring officers were thanked, and Messrs. W. M. Shannon, J. J. O'Sullivan were elected Chairman and Vice-chairman, and Mr. G. Harris re-elected Hon. Sec.

Boothby, September 3.

Present—Messrs. J. T. Whyte (chair), R. M. B. Whyte, E. Bradley, J. A. Foulds, M. Leonard (Hon. Sec.), and one visitor.

STORAGE OF WHEAT CHAFF.—Hon. Secretary read the following paper:—

In many localities in this State wheat chaff is much used for the feeding of horses during seeding time, but very few farmers in the past have made any legitimate attempt to save it for more than the one season. The usual way is just to cart in enough to feed their horses during the seeding; the balance is allowed to be burnt or go to waste by wet. In a country subject to varying seasons, as undoubtedly this State is, it is a great loss to have it so wasted. I have heard it said that wheat chaff is not worth the labor and expense incidental to the storage of it. With that I disagree. During the past drought many farmers have carted chaff long distances, and then perhaps paid 6d. or 8d. per bag; whereas if these people had erected sheds and stored all spare chaff during the years of plenty their burden of seeking horse feed during the dry time would have been much lessened. Certainly, the chaff gathered during the good seasons is not nearly so nutritious as that harvested from prematurely ripened wheat; the latter, when quantities of the flag are gathered with it, being nearly equal to hay as a fodder; but even the chaff alone contains sufficient nourishment for cattle or horses to live upon, and with the addition of pollard or bran they will fatten and do well. Our only means of attempting to judge the future is by reference to the past; and the lesson many have learned from the past is to store up all available stock feed during the plentiful years, as it may be

required in the future. And for that purpose the farmer requires a shed or sheds large enough to hold the surplus chaff for three or even more years. As regards the construction of such shed, if timber can be secured locally for the erection of the framework, so much the cheaper; even if not, the cost of timber for such purpose would not be much. For covering the sides and ends I think paling boards are the cheapest, and will be found very effective against wet beating in. The roof should be of corrugated iron, preferable to straw in many ways; not such a strong framework required, less danger from fire, and under it you have your chaff perfectly secure from the weather. A shed with storing capacity sufficient for the ordinary sized farm could, on the principle I have just indicated, be erected at a cost of about £30 for material. If framework had to be purchased it would mean an extra £20. Money spent in this direction is money wisely spent, as the chaff thus secured may be the means of saving the farmer many hundreds of pounds during the time when feed is scarce.

Mr. Bradley built his chaff shed with mallee stumps and roofed with straw. Mr. Way preferred stone barns. Mr. Foulds would cover thatch with wire net to prevent fowls scratching. The Chairman had known chaff to keep good for years when merely covered with straw. All members are agreed that it will pay to save straw immediately after harvest.

ANALYSIS OF SOILS.—Owing to the great variation in the soil of any one field, Mr. Foulds would not place too much reliance upon analyses; but every farmer should try to find by experiments with crops and various fertilisers in differing quantities and mixtures of manures to ascertain wherein his fields are deficient in any item of plant food. Mr. J. R. Way favored analyses of soils, and would like to have facilities offered for such analyses.

STABLE MANURE.—Mr. Foulds said he believed that well-prepared stable manure contained everything necessary for plant life. Mr. Way, from his experience, had concluded that stable manure contains everything not necessary in a garden [Well-prepared stable manure does contain most of the requisites for plant life. If it is not well prepared it may give cause for industry in the destruction of weeds.—GEN. SEC.]

Wilmington, August 30.

Present—Messrs. A. Maslin (chair), M. Gray, J. Hannagan, J. McLeod, J. Lauterbach, R. Cole, J. Zimmermann, F. Bauer, and R. G. S. Payne (Hon. Sec.).

WHEATS FOR ARID DISTRICTS.—Where cheap means of irrigation cannot be availed of, members are convinced that only such varieties of wheats that are able to arrive at maturity under natural rainfall of any arid district should be sown.

FUNDS OF BRANCH.—Whenever cash is required for purchase of a bull, or of seeds, or for any purpose, voluntary subscriptions are contributed by members. No levies have been made, and no charge is made for use of meeting room.

Golden Grove, August 29.

Present—Messrs. R. Smith (chair), J. Ross, S. A. Milne, F. Buder, W. Mountstephen, J. Woodhead, J. R. Smart, A. Harper, A. Robertson, and J. R. Coles (Hon. Sec.).

AGRICULTURAL ADVANCEMENT.—A lively discussion took place upon this subject, and it was agreed that great progress had lately been made since the introduction of the use of drills and commercial fertilisers, and the lectures and experiments by Professor Lowrie have considerably helped the movement. The experiments conducted by farmers all over the State, as well as at the Agricultural College, have all led in this direction; but the circumstances of soil, rainfall, locality, &c., differently affect the results of all experiments and

practices; and for this reason there has been and still exists a necessity for organised efforts in all parts of the State for the conduct of experimental cultivation. Fairly large areas of land should be occupied for several years in succession in testing the comparative values of seeds and manures in varying quantities and combinations. These experiments could be conducted in connection with the Agricultural Bureau, and would be of the greatest value to the farmers and the State at large.

EXHIBIT.—Mr. Buder tabled some Rokewood apples, picked in May last. They were firm, well flavored, and in excellent condition.

Bute, August 27.

Present Messrs. W. H. Sharman (chair), A. Schroeter, H. Schroeter, S. Trengove, M. Hall, M. Stevens, J. H. Brideson, J. H. Burnes, D. McEvoy, F. Trengove, A. Sharman (Hon. Sec.), and two visitors.

PAPER.—Mr. McEvoy read a paper entitled "Interests of the State and People," to the following effect:—

Being convinced that the quality and natural resources of the land affect the condition of the people in any country—especially where wheat-growing is the chief industry—he would deal with that staple, which probably sustains a larger population than any other product. This industry requires the aid of science, and the operation of wise laws to ensure its prosperity. The Government had done next to nothing to find an export market for surplus wheat. This tended to monopoly by the wheatbuyers, as the farmers had no representative to watch their interests and effect sales of wheat on the British and Continental markets. The Government has done its utmost to settle people on the land, and the farmers are using science and enduring hardship and toil to obtain the best results. It has been proved that South Australian wheat is equal to the best for milling, but the corrupt practice of some dealers in placing other and inferior wheats on the markets under the name of Adelaide wheat has caused our wheat to lose its good name. To remedy this unfortunate state of things, he thought the State should assist the Farmers' Union to send a representative to London to effect sales of wheat and to obtain the best prices.

Members considered that a shareholders' meeting of the Farmers' Union was a more suitable place for discussion of this paper.

Cherry Gardens, September 10.

Present—Messrs. R. Gibbins (chair), T. Jacobs, J. Lewis, C. Lewis, J. Potter, J. Richards, G. Brumby, G. Hicks, A. Broadbent, J. Metcalf, W. B. Burpee, and C. Ricks (Hon. Sec.).

BIRDS.—Considerable discussion took place on the necessity for the protection of birds. Mr. Jacobs urged members to do all in their power to prevent boys from destroying useful native birds. All members agreed as to the necessity for destroying sparrows, but there was a difference of opinion as regards the starling, some members thinking they did more good than harm.

Morphett Vale, September 3.

Present—Messrs. H. Smith (chair), T. Anderson, J. McLeod, G. Goldsmith, F. Pocock, J. Bain, R. Binney, F. Hutchinson, L. F. Christie, A. Jones, J. Depledge, A. Perry, and A. Ross Reid (Hon. Sec.).

BIRD PESTS.—Considerable discussion took place as to best means of lessening the numbers of destructive birds, more particularly sparrows. It was decided to ask the district council to pay for heads and eggs of sparrows, starlings, and silver eyes at the following rates:—Heads of old birds, 6s. per

100; heads of young birds, 2s. 6d. per 100; and 1s. per 100 for eggs. Last year 6s. per 100 was paid for old birds, and 2s. 6d. for young birds and for eggs, with the result that the losses from the ravages of birds were considerably lessened.

SOURSOPS.—Mr. Bain initiated a discussion on the spread of this weed (*Oxalis cernua*), known as soursops or yellow oxalis. He strongly condemned the manner in which the weed was being sent into clean districts, one of the principal means of distribution being trees from the nurseries round Adelaide. Trees are sent away with the small bulbs attached to the roots. Persons buying trees should pay attention to this matter, as the weed was most troublesome, and once it gains access to a paddock it is almost impossible to prevent it from spreading.

Penola, September 7.

Present—Messrs. W. Miller (chair), D. McKay, H. Ricketts, S. B. Worthington, J. W. H. Sandiford, L. W. Peake, E. F. McBain, Dr. F. Ockley (Hon. Sec.), and two visitors.

MANURING.—Discussion took place on paper by Mr. McBain, read at previous meeting. Mr. Ricketts stated that he had mixed sand with sticky superphosphate, to make it run freely through the drill, and although an extra quantity, sufficient to make up for the sand that was added, was put into the soil, the results were decidedly negative. Mr. T. H. Morris had mixed lewt. Thomas phosphate with 1 ton of mineral super.; it ran freely in the drill and gave excellent results. Mr. H. Morris (visitor) said his experience in mixing Thomas phosphate with sticky super. was similar. Mr. Ricketts advocated planting a larger quantity of seed per acre, as a very considerable proportion was always injured during threshing. All members were agreed that the use of the drill and chemical fertilisers had given a great impetus to scientific agriculture, and that good yields can now be obtained with greater certainty. Mr. McBain strongly advocated more liberal dressings of manure. The quantity of super. usually applied was not sufficient to secure the best returns, and with the almost certain rainfall of the South-East he recommended dressings of not less than 2cwt. per acre for cereal crops.

Mallala, September 2.

Present—Messrs. G. W. Bischof (chair), J. McCabe, J. Churches, A. F. Wilson, T. Nevin, M. H. East, W. Temby, S. Temby, H. B. Moody, W. R. Stephenson (Hon. Sec.), and two visitors.

DAIRYING.—Mr. Jas. McCabe read a paper to the following effect:—

The first thing is to provide for at least one year's supply of suitable fodder for the number of cows that it is intended to keep. The cheapest and best food for milking cows is good Cape oaten hay, cut when the grain is full, and always chaffed to prevent waste and mix the grain evenly. For dry cows and young stock barley, rye, or wheat can be made into silage for summer feed, and sorghum grown on fallows where suitable. Some wheat or rye should be sown on the stubbles that are to be left for pasturage. Cows should be fed after milking, as they will stand more quietly and give down their milk more regularly than when they are fed before milking. They should be milked each in her regular turn—that is, the same cow to be milked first, and the second one next, day after day, and so on through the herd. They should be made to stand in their rotation and the same position every time. Milk steadily at commencement, and faster as the cow gives down her milk. Grip the teats so that the milk shall not return to the udder. The two back teats should be milked first, and the front ones next. The best cows are those of large frame, provided they are good milk-producers. It is easy to find bad cows of any breed, and hard to make good milkers of them. It is possible to get good cows of any breed, but in some cases it is hard to keep them good. A large cow,

being a good milker, if crossed with a good dairy strain bull, Durham or Hereford, will most probably produce superior heifers. All inferior cows should be weeded out. Cows can be spoiled by being milked for too long a period. A cow should be dry for at least three months before calving, and be well fed all along. Heifers should be milked for six months only. Cream should be churned every day, each day's cream separate, as the longer cream is allowed to stand the more streaky will the butter be. If cream is gathered for a week some is over-ripe, some not ripe enough, and some churns into butter before the rest, causing the butter to be faulty and of less value.

The Hon. Secretary had failed every time to grow green fodder during summer, and he had fed his cows largely on bran. He did not think it necessary to churn every day. Mr. H. B. Moody said that oats steeped forty-eight hours mixed with a portion of oil cake makes a splendid food for calves, and will produce a quick return. He advised a good sprinkling of treacle on chaff for cows. Mr. East did not think silage, with molasses, could be beaten as summer food for milking cows, but the silage should be chaffed before being put into the pit.

Renmark, August 29.

Present Messrs. E. Taylor (chair), W. Moffatt, M. Chaplin, R. Kelly, C. Millar, W. Waters, F. Cole, and J. A. Forde (Hon. Sec.).

RESULTS OBTAINED BY USE OF ARTIFICIAL FERTILISERS.—The Hon. Secretary read a lengthy paper upon results of experiments conducted with various commercial fertilisers in vineyards of France and Germany, on soils of most diverse character—sandy, limy or calcareous, flinty, &c. In twenty-five vineyards of the Gironde—one of the claret-producing portions of France, the vineyards, when fertilised in the old style with farmyard manure, produced less than $\frac{1}{2}$ of a ton of grapes per acre, but when treated with 480lbs. phosphate, 160lbs. sulphate of potash, and 400lbs. nitrate of soda per acre, the yield was 6,130lbs of grapes, or $2\frac{1}{2}$ tons. In Hungary a poor sandy soil gave 7,720lbs., or $2\frac{1}{2}$ tons per acre, when manured with phosphate, potash, and nitrogen. The conclusions arrived at by the experimentalists were that the liability of vines to disease was owing to weakness, caused by the absence of sufficient phosphoric acid and potash in farmyard manure; and when the owners applied phosphates and potash the vines immediately assumed a healthy appearance, and after four years of such treatment they became vigorous and highly productive.

Mount Compass, September 14.

Present—Messrs. R. Cameron (chair), F. Slater, W. Gowling, A. Sweetman, E. C. Good, J. Jenkin, F. McKinley, C. S. Hancock, A. J. Hancock (Hon. Sec.), and one visitor.

SEASONABLE OPERATIONS.—For September—Plant potatoes on protected parts of swamps and slopes. Sow cabbages, peas, broad beans, mangolds, beets, carrots, and parsnips. For October—Plant potatoes, cabbages, onions, and tomatoes. Sow main crops of beans, peas, all the melon tribe, maize, and sorghum.

POULTRY-KEEPING.—Mr. A. Sweetman read a paper on this subject, to the following effect:—

Poultry-keeping is worthy of the special attention of settlers in this locality, where conditions do not favor the rearing of cattle and other large stock. The axiom holds good here that "Whatever is worth doing is worth doing well." The essentials to success in poultry-keeping are proper housing, feeding, &c., and the proper variety for the purpose. The poultry run should be well sheltered and made thoroughly fowl-proof. Plenty of clean water, grit, lime, bonemeal, and shells should be provided to furnish material for the formation of shells to the eggs; also dry dust to expel vermin from the feathers. If shells or other form of lime should

be deficient the hens may lay soft-shelled eggs, which will induce egg-eating: a habit very difficult to remedy, except by cutting off the hen's head. The fowlhouse should be swept every day, and thoroughly cleaned at least once a week, the perches lime-washed, and sulphur or carbolic acid used if vermin should exist. Feeding is of the utmost importance, as profit or loss depend upon this matter. Bran, pollard, and similar meals should be well mixed with hot water and left to swell; small potatoes and pumpkins, washed, cooked, and mashed with pollard, make excellent food. All feeding vessels should be kept quite clean, and no food allowed to be left to go sour in them. Wheat, barley, peas, oats, maize, sunflower seed, and skim milk are good for fowls. Sunflower seeds in moderation are good, especially at moulting time and during cold weather, as they are heating and fattening food. Carob beans ground and mixed into a paste are excellent for fowls. Green feed is also essential, and can be provided in cabbage, kail, silver beet, lettuce, and endive. The latter are bitter and act as a tonic during hot weather. Chickens should be hatched early, and should begin to lay at end of sixteen weeks, when the old hens begin to moult and eggs fetch a good price. The best breeds for laying are White and Brown Leghorns, Minorcas, Dorkings, and Wyandottes. With the aid of water glass and other preservatives eggs can be held over until the market prices are suitable—it is a mistake to rush eggs on to a low market. Unfertilized eggs placed at once in the solution of 1 lb. of water glass in two gallons of water will keep perfectly good for six months. Last year the export value of poultry and eggs sent from Victoria exceeded the total value of the wool. An average hen, well kept, will return a net profit of 10s. per annum.

Mr. Good had found poultry of great use in his garden in eating out weeds and destroying pests. He uses a cage made of wire netting, 14ft. long, 4ft. wide, and 2ft. high, and a detachable coop. This contrivance is portable, and he moves it from place to place in his garden, placing about ten fowls under it. They get abundance of green feed, grubs, caterpillars, and other insects. Mr. Gowling thought food for poultry should be grown by the blocker if he wished to make a profit. Mr. F. Slater gives bonedust or bonemeal to his fowls with beneficial results. [Fresh bones, ground up by means of a small bonecutter made for poultry-keepers, are the best.—GEN. SEC.] He preferred the Minorcas for this locality, as they are larger than the Leghorns. Mr. Jenkin thought it would pay to buy sound wheat at 2s. 6d. per bushel for feeding fowls.

Watervale, September 29.

Present—Messrs. C. A. Sobels (chair), H. Beck, E. E. Sobels, G. Hunter, H. Scovell, W. Smith, T. Solly, B. Perrin, E. W. Castine, and E. Treloar (Hon. Sec.).

EXHIBIT.—Mr. W. Smith tabled several varieties of apples, including very fine Cleopatras.

SLUGS.—Mr. W. Smith said slugs were doing a lot of damage, especially to fallen oranges. [Why not clip and store them before they become so over-ripe.—GEN. SEC.]

Forest Range, September 19.

Present—Messrs. J. Rowley (chair), J. Green, W. McLaren, W. Cherryman, R. E. Townsend, A. S. Gunning, H. H. Waters (Hon. Sec.), and two visitors.

RULES.—Considerable discussion took place on the rule *re* non-attendance of members. The Hon. Secretary pointed out that the rule bearing on the subject provided that if any member was absent for three consecutive meetings without sending a reasonable excuse he should forfeit his seat. As they had decided to strictly enforce this rule, provision should be made for granting leave of absence in special cases, such leave not to exceed six months. Unless this were done it would sometimes occur that the services of real good active members would at times be lost. It was decided to amend the rule to make it read "Any member absent from two consecutive meetings shall be notified by

the Hon. Secretary when calling the next meeting that should he be absent from same his seat will be declared vacant." [If this rule is fully enforced it will mean that any member who is absent for three meetings, from sickness or perhaps absence from the district for a few months, will lose his seat. Provision should certainly be made for leave of absence being granted in special cases. — GEN. SEC.] It was also decided to appoint a committee to draft, for consideration of members, a code of rules for the efficient working of the Branch.

Gawler River, August 30.

Present—Messrs. J. Badman (chair), H. Roediger, R. Badcock, D. Humphreys, J. Hillier, E. Winckel, W. Clark, C. Leak, J. S. McLean, T. P. Parker, F. Roediger, A. M. Dawkins, and A. Bray (Hon. Sec.).

DISCUSSIONS AT MEETINGS.—It was resolved that each member should be responsible for initiating a discussion at meetings.

IMPROVEMENT OF HORSE STOCK.—Mr. Badman initiated a discussion on this subject, and referred to the degeneracy of our horse stock. Mr. Parker thought this was partly due to the use of mongrel, over-worked mares, and to the foals being underfed. Members agreed that good feeding of the foal after weaning was essential to the development of a good horse. Care must also be exercised in choosing both sire and dam. The sire should be sound, and the mother of good capacity. Mr. Parker thought a horse with a strain of blood in it was preferable to a heavy draught for farm work. Members agreed that a horse so bred was more active, but for work on the roads weight was necessary. They also agreed that nothing under three years old should be used for breeding purposes. Mr. Dawkins thought both sire and dam should be in their prime to produce good stock. Many make the mistake of using old worn-out mares for breeding; the progeny in such cases was likely to be inferior and lacking in stamina.

FEEDING HORSES.—Oats were considered the best feed for horses. Some members preferred whole oats, while others held that if fed uncrushed there was a danger of some of the seeds passing the animal undigested and thus dirtying the land. Mr. Dawkins said oats contained a volatile oil, and if crushed for any length of time this was lost. Mr. Badcock stated his horses did not seem to do so well on hay from land manured with super. as from unmanured land. Other members' experiences did not agree with Mr. Badcock's, and it was thought that the experience at Roseworthy College, where the system of manuring had been adopted for a number of years and heavier dressings were given than most farmers applied, was proof that the hay was not injuriously affected by the super. [Unless the manure causes a rank watery growth it will, if anything, improve the quality of the hay; certainly no injurious effect will be the result.—GEN. SEC.]

Finniss, September 2.

Present—Messrs. Jas. Chibnall (chair), T. Collett, A. E. Henley, S. Eagle, H. Langrehr, and S. Collett (Hon. Sec.).

HAND SEPARATORS AND FACTORIES.—Mr. Jas. Chibnall read a paper to the following effect:—

Much has been written by dairy managers and others against hand separators. The evening's milk is kept over night for the factory, and any dirt or bad odor remains in until the milk is separated. That would naturally affect the cream. Where there is a hand separator on the dairy farm the milk is run through directly it is taken from the cow, and the cream ought to make a better-keeping butter. From the farmer's point of view it appears to be less

profitable to sell milk to the factory than to separate the cream, use the sweet skim milk for his calves and other stock, besides saving time in cartage to factory, wear and tear of harness, vehicle, &c., and send the cream to the factory for manufacture into butter. The mixed skim milk from the factory—during summer at any rate—is more or less charged with preservatives, and is generally sour, both of which conditions are not favorable for calves or other stock. Then, again, there may be some cows in other herds that are affected by tuberculosis or other diseases, which may possibly convey the diseases to other herds by means of their milk mixed at the factory and divided amongst the patrons thereof. There is no better exercise for a weak-chested youth than working a hand separator, and if the cream is not churned at home it can be sold to the factory, where, if the factory is properly equipped, its butter value can be readily tested in a few minutes, and the cream can then be churned in bulk with other lots similarly tested, and an even quality of butter produced.

Considerable discussion took place, and the Hon. Secretary agreed to read a paper at the next meeting dealing with the other side of the question.

Orroroo, September 20.

Present—Messrs. W. S. Lillecrapp (chair), J. Moody, E. Copley, J. Roberts, M. Oppermann, J. Scriven, W. Robertson, R. Coulter, and T. H. Tapscott (Hon. Sec.).

FEEDING STOCK.—Mr. Scriven read a paper on “Economy in Feeding Stock,” to the following effect:—

He always fed well, on the principle that an animal that will not pay for feeding is not worth keeping either for work or for sale. Farmers must study economy—especially those who reside north of “Goyder’s line of rainfall.” Deficiency of rain means scarcity of feed, and the farmer then has to resort to wheat chaff, straw, chaffed hay—if he has either. Wheat chaff (or so called cocky chaff) will maintain life in stock, but in order to keep them in fair condition the farmers must use bran, pollard, or boiled wheat pretty freely mixed with the chaff. He had worked horses hard on wheat chaff with half a bag of pollard per week for each of the team. Frosted straw chaff is good for horses when mixed with an equal quantity of wheaten hay chaff. Horses like that better than wheat hulls and whenten hay chaff. When crops are frosted as much as is possible of the straw should be stacked, and all the better if out with the string binder. Chaffed hay is more economical than long hay, as the horses seek for the heads and throw the butts out of the manger. It is not economical to allow animals to become poor in winter or at any other time, even if they are not wanted for use at that time. They are liable to disease when poor, and perhaps may die, and the cost of re-establishing their good condition and health, or of replacing them if dead, will be much greater than the cost of the food necessary to maintain condition, health, and life. True economy does not consist so much in the saving of cost as in the value of the things when you have got it. If the chaff merchant has two prices for chaff, one being 20s. per ton cheaper than the other, true economy would decide to take that which gives the best value for the money. Bad feed gives bad results, and the dearer article may be really much cheaper than the lower-priced stuff. Screenings for fowls’ food contain a deal of drake and other rubbish, and it is much more economical in most cases to purchase sound grain at a higher price. If it is required that a horse shall work well, a cow to milk well, a pig to grow, or a hen to lay, then feed them well.

Petersburg, August 31.

Present—Messrs. W. Miller (chair), S. Bottrill, J. Cadzow, H. Earle, D. Naughton, J. Wilson (Hon. Sec.), and two visitors.

WOUNDS ON STOCK.—Mr. Earle inquired as to treatment for large wound on horse’s leg caused by barbed wire, and from which the joint oil was escaping. He had swung the animal and had fixed the leg in an iron frame to prevent motion of the limb as far as possible. Members were doubtful whether the animal would ever thoroughly recover; the leg would probably always be stiff. In many instances, however, when the joint oil is supposed to be escaping it was not so. It was recommended to keep the wound clean, and apply either carbolic lotion or Stockholm tar.

Gladstone, September 7.

Present—Messrs. J. Gallasch (chair), W. Wornum, J. R. Smallacombe, C. Gallasch, J. Rundle, W. Brayley, and C. Goode (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary's report showed that during the year nine meetings had been held, with an average attendance of over eight members. Three papers had been read, and numerous matters of practical interest had been discussed. Greater interest generally had been manifested in the work of the Branch, and the members were determined to make the coming year even more successful.

TAGOSASTE.—Mr. Wornum stated that twelve months ago he soaked some tagosaste seed in nearly boiling water and sowed the seed. Some germinated early, but the plants died off; other seeds remained in the soil for several months, and these plants are now growing well.

CONFERENCE OF BRANCHES.—It was decided that the next Annual Conference of Northern Branches be held at Crystal Brook. Several of the Northern Branches expressed a desire for the Conference to be held there, and the local Branch has agreed to make necessary arrangements.

Port Elliot, August 24.

Present—Messrs. J. McLeod (chair), J. Brown, W. E. Hargreaves, H. Green, sen., H. Pannell, R. E. Ullrich, H. Gray, H. Welch, J. R. Coote, J. Nosworthy, C. Gorden, and E. Hill (Hon. Sec.).

PAPERS.—It was decided that all papers read before this Branch be handed to the Hon. Secretary at the close of the meeting. [This should always be done and the papers sent on with report. Sometimes members decline to hand their papers over to the Hon. Secretary, the consequence being that that hard-worked officer has to write an abstract from memory, or allow it to appear as though the paper was not worth publishing.—GEN. SEC.]

COWS ON THE FARM.—Mr. Jas. McLeod read a paper to the following effect:—

There are few farms where at least some cows are not kept; and most people will admit that the cow is one of the most profitable animals. No farm should be without cows, but the number must be regulated by the pasturage. As to breed, opinions vary. The Jersey seems to be too small and delicate, especially for the wet hilly country, and the Shorthorn is too big. Perhaps the best is a cross between the Jersey bull and the Shorthorn cow, which will give a fair-sized cow, with hardy constitution, and generally a heavy milker with a good percentage of fat. The parents should be selected with due regard to their dairy records. An early calf is worth two late ones. If dropped in March or April it will have the benefit of the grass when it is at its best. The calf should have milk twice a day until it is three months old, and then once a day until five months old, after which grass is sufficient. Keep the animal well fed from the start to the finish. It will never pay to let the growth languish or stop. Keep the yearlings on the best paddocks until two years old, then turn the bull in with them. The heifers will be three years old when they come into milk, and will be strong well-developed cows, better able to stand the strain of milk-production—much better than if they come in younger. When cows come in between September and January they will have plenty of natural grasses, which at that time are at their best in this locality. After then the cows must be supplied with feed, else they will fall off in condition and in quantity of milk. When the natural grasses fail, the cows generally take to chewing bones, dry sticks of the Sodom apple plant, &c., which shows that there is something deficient in the dry natural pasturage. About a handful each of bonemeal and salt, mixed with chaff and copra cake once a day has proved very beneficial in preventing or curing the early symptoms of impaction or acute indigestion, which is first evidenced by stiffness of the joints. If a supply of green feed could be constantly provided, nothing could be better; but where water is deficient there is no chance of growing green crops. He had no experience with ensilage. [Why not gain experience, since about a million of dairy farmers throughout the world have spoken so favorably of it?—GEN. SEC.] Chaff and bran make a cheap and good food for cows. About 16lbs. of hay chaff, and 4lbs. bran, costing about 7d., will make two feeds per day for a cow. For a change,

substituto copra cake for the bran. In every dairying district there should be a co-operative butter and cheese factory in a central position, with a thoroughly competent man in charge. Every farmer should support the factory, and should be paid for his milk by percentage of butter fats. This would encourage improvement of the breed of cows. A gallon of milk will make a pound of cheese; and about 2½ gallons will produce a pound of butter. When butter sells at 8d. per pound, and cheese at 6d. per pound, it will probably pay best to make cheese. In large districts the more distant farmers would need a separator, and carry only the cream to the central factory. [Or the factory could establish a small auxiliary to deal with the milk, and carry the cream or the newly-made cheese to the central place for further treatment.—GWN. SEC.]

POULTRY.—Mr. Coote read a short paper on this subject, but failed to hand it to the Hon. Secretary.

Redhill, September 23.

Present—Messrs. D. Lithgow (chair), C. Brown, A. E. Ladyman, F. Wheaton, L. R. Wake, H. Darwin, D. Steele, A. McDonald, and J. N. Lithgow (Hon. Sec.).

PRIVATE SEPARATORS V. FACTORIES.—Mr. Lithgow reported on proceedings at Congress, and referred to the discussion upon co-operative dairy factories and the alleged injury caused by farmers using their own separators. By vote it was decided that in the northern districts farmers could only carry on dairy operations by using their own separators.

Port Elliot, September 21.

Present—Messrs. J. McLeod (chair), J. Brown, W. E. Hargreaves, J. Nosworthy, R. E. Ullrich, and E. Hill (Hon. Sec.).

VERMIN AND DOGS.—Mount Compass Branch wrote *re* reducing fees for registration of dogs in view of the fact that the local council was enforcing the destruction of rabbits. Members present were of opinion that any reduction of the fees at present charged would lead to the keeping of a class of dogs that would become nearly as great a pest as the rabbits are now.

DOUBLE-SHELLED EGGS.—Mr. Hargreaves tabled small hen's egg with hard rough shell which was found inside the yolk of an egg that had been boiled for breakfast.

PIGS ON THE DAIRY FARM.—Mr. Nosworthy read a paper on "Rearing and Fattening of Pigs on a Dairy Farm." This was a profitable undertaking for any farmer, provided it was carried out on proper lines, but if badly managed will turn out a needless waste of food and labor. In regard to shelter, pigs were more neglected than any other farm stock. Most farmers think anything is good enough for the pig. This is, however a great mistake, as pigs will not thrive in a cold wet sty. Bring in all the spare straw and house them warmly. For breeding, obtain a pure bred Essex or Berkshire boar, the latter for preference, and good shapely cross-bred sows. The latter are usually better than the pure-bred, being better mothers and rearing more pigs. September and March are the best months to have the sows to litter. The sow must be well fed while suckling the young pigs, which should be weaned when about six weeks old. When weaning, feed them well on skim milk mixed with a little pollard. It does not pay to starve them; once stunted it takes a lot of food to start them growing again. Pigs from four to five months old are the most suitable for porkers; the second prize pigs at the recent show in Adelaide were bred by him, and were about this age. He preferred sending the pigs to market as porkers to keeping them for bacon. He considered peas one of the best foods for fattening pigs. Considerable discussion followed, the following being the principal points noted:—Bacon from pigs of the Essex breed had a tendency to remain

oily and fatty, and did not set like bacon from Berkshire pigs. The weight of porkers at from four to five months will average from 70lbs. to 90lbs., according to feeding. Mr. Brown suggested the Poland-China for crossing, but this was not generally favored, though it was admitted that the sows were good mothers. Mr. McLeod advocated the Berkshire sire and cross-bred mother for both porkers and bacon pigs. He also read from June issue of *Journal of Agriculture* paper read at Mount Pleasant Branch by Mr. H. A. Giles on "Pigs and the Saving of Manure." This led to a useful discussion, members generally agreeing with the writer of the paper.

Minlaton, September 21.

Present—Messrs. Jno. Anderson (chair), James Anderson, W. Honor, H. Boundy, F. Brown, M. Twartz, James Martin, D. G. Teichelmann, R. G. Newbold, H. Martin, A. McKenzie, E. Correll, and J. McKenzie (Hon. Sec.).

"WILL POULTRY-KEEPING PAY?"—Mr. James Anderson read a very lengthy paper, consisting chiefly of extracts, to the following effect:—

Carefulness in poultry-keeping is essential to success. "Trouble" is a word that does not enter the vocabulary of the lover of the feathered tribe. The pleasure and excitement connected with the care of fowls compensates for loss or absence of all other sources of amusement or pastime. The French are celebrated for the quantity and the quality of their poultry. Their principles are early hatching, early killing, liberal feeding, stimulating food. They keep only the very best breeds either for laying or for quick growth. They keep their stock always young. Risk of disease is prevented by stimulating food and rapid fattening and sale—keeping up a constant succession. It is useless to expect eggs in plenty and fat fowls when the birds are neglected and insufficiently fed. I. Wright says, "Any account fairly kept, and with judicious management, will prove conclusively that those who believe poultry cannot be made remunerative do a grievous wrong to the most profitable and productive of any live stock in the world." Another author says, "The various products of poultry properly managed form the cheapest animal food that can be procured." Numerous other authorities were quoted, all to the same purport, that, if carefully conducted, poultry afford a reliable source of income to their owners. If anyone were about to enter upon poultry-keeping on a large scale it would be necessary to provide comfortable quarters, to avoid overcrowding, keep the place scrupulously clean, provide dry dust or ashes for wallowing in to drive vermin out of the feathers. The best kinds of hens for winter and for summer laying must be kept, and suitable kinds for crossing for table birds must be secured. Feed liberally (yet not more than the birds clean up at each meal), provide abundance of water in a cool shady place, and hatch chicks at the proper time to secure the highest price for eggs or flesh when they are ready for marketing. [The whole gist of the argument was that a man who devotes his best attention to the management of the poultry will make the business pay, whilst neglect will result in failure. GEN. SEC.]

All members agreed that nests should be on the ground. Mr. Honor would not keep any fowl longer than two years, and would change the males every year to prevent inbreeding.

Naracoorte, September 6.

Present—Messrs. S. Schinckel (chair), E. C. Bates, H. Buck, G. Wardle, F. Welcome, A. Caldwell, J. Wynes, H. Smith, and A. Johnstone (Hon. Sec.).

OUR FORESTS.—Chairman directed attention to a statement made at Brinkworth Branch meeting recently by Mr. McEwin, that the forests in the South-East had nearly doubled during recent years. He was of opinion that this was not in accordance with fact—at least he could not see any evidence of its truth in the country he was acquainted with. Mr. Wynes believed that for every tree planted a dozen had been destroyed.

AGRICULTURAL EDUCATION.—Members regretted that a paper by Mr. A. Johnstone, entitled, "Suggestions for Making the Services of the Professor of Agriculture more Instructive to Farmers," was sent in too late for inclusion on

the agenda of the recent Congress of the Agricultural Bureau; and at the request of members Mr. Johnstone now read it. In discussion it was considered that good is resulting from the spreading of knowledge amongst tillers of the soil. The question was raised whether the Professor of Agriculture could spare much time to go through the country to give lessons to farmers on farming experimental plots, seeing that he has a large college of students and a farm to look after. Would it be better to have a well-qualified agricultural lecturer to travel through the country and do nothing else? It was held that the Professor could not travel through the country and at the same time do justice to his students and his farm and experimental work at the College.

TUBERCULOSIS.—Mr. Bates mentioned the recent conference of scientists in Europe, where Professor Koch expressed his doubts whether bovine tuberculosis can be communicated to mankind. The Chairman said other eminent authorities differed from Professor Koch, and were of opinion that infection can take place from the milk of tuberculous cattle. [It is well known that the germs of tuberculosis are killed by being submitted for ten minutes to a temperature of 180° F. If milk is boiled or meat is properly cooked there is no possible danger to persons consuming it.—GEN. SEC.]

PASPALUM DILATATUM.—Mr. H. Buck said he had been told of the value of the "Golden Crown grass" (*Paspalum dilatatum*), which should do well in this district. From 5lbs. to 8lbs. of seed per acre were required. The Chairman said the better plan is to raise plants in a nursery bed and transplant them.

Clarendon, September 9.

Present—Messrs. J. Wright (chair), J. Juers, J. Piggott, W. A. Morphett, W. Spencer, E. Dunmill, A. L. Morphett (Hon. Sec.), and one visitor.

CULTIVATION OF ORCHARDS.—It was decided to offer a prize for the best-kept fruit garden, in order to encourage better methods of cultivation.

CODLIN MOTH.—Mr. Spencer drew attention to the practice of some growers of leaving last year's bandages on the apple trees. It was quite time these bandages were removed and burnt. He hoped members would do all they could to see that the regulations were properly carried out this year.

POULTRY.—Mr. A. L. Morphett read a paper to the following effect:—

His object in taking up this subject was to endeavor to induce members to inquire as to whether it was not possible to increase their income by paying more attention to poultry. It would pay to devote more time and attention to poultry-keeping. Most of them kept a good many fowls, but are they the best kinds? They must look principally to egg production, and endeavor to get eggs in winter when they are worth a good price. He considered the Leghorn and the Minorca the best breeds for their purpose. The Leghorn pullets mature very early, commence to lay at about four months, are fairly hardy, and good foragers. They will pick up most of their living where there is any chance of doing so. They are smaller than the Minorcas, but square bodied, of fine quality, and lay pure white eggs of uniform appearance. The Minorca is also a wonderful layer, the eggs being white and large. The comb is very large, and the birds of fair size, sharp and active in appearance, and free from colored feathers. The hens are non-setters and splendid layers. If poultry are to be made profitable a suitable house must be provided—one that can be closed is necessary in order that the birds may be shut out of the garden when not wanted there. The house must be clean and free from vermin. To get rid of lice or ticks in the house spray with kerosine emulsion, and then whitewash, using carbolic in the latter. To improve good laying qualities of ordinary fowls obtain a good Minorca or Leghorn rooster and mate him with the best layers you have. Pen up not more than twelve good hens with the rooster, and breed only from these. For eggs a rooster is not required. When fowls are at large they obtain a great variety of food, and if penned up they must be supplied with different kinds of food if the best results are to be obtained. A proper account of expenditure and receipts should be kept in order that the profit or loss can be readily found out. He had noticed the statement of one poultryman who claimed to make 6s. per annum from each hen, while another claimed to be making £500 per annum profit by

keeping ducks on seven and a half acres of land. An American paper states that the production of eggs and poultry in New York State has increased to such an extent of late years that it now far exceeds the outturn of the dairy industry. The two industries go well together; the keeping of fowls does not interfere with the keeping of cows, while the skim milk is one of the best egg-producing foods. A few years ago scarcely anyone knew whether poultry really paid or not, but a few enterprising men demonstrated that there was money in poultry with the result that others took up the business, and now nearly every farmer keeps hens and gives them the same attention as other branches of the industry. Great attention has been paid to the breeding of stock purely for egg production, and by judicious selection the capacity for egg-laying has been increased to a very large extent.

Balaklava, September 7.

Present—Messrs. P. Anderson (chair), G. Reed, A. Manley, W. Smith, W. Tiller, G. C. Neville, and E. M. Sage (Hon. Sec.).

MEMORIAL TO THE LATE C. H. SMITH.—Members do not favor proposed memorial to the late C. H. Smith, of Ardrossan, as, although he greatly improved the stump-jumping plough, he patented all his improvements, and so reaped the benefit of his enterprise.

CASTRATING COLTS.—Mr. Tiller read a paper on this subject. He advised breeders to castrate their colts about the end of August or beginning of December if they are beginning to thrive, as the operation will not check them so much as when too fat. Colts should be castrated when about a year old. He had treated colts of various ages, from six weeks up to ten years. If castrated at the age of six weeks they do all right, but are inclined to go off the milk for a day or two, with the result that the mare's udder gets sore and hard, and she will not let the foal suck afterwards. In throwing a colt put on a pair of blinkers to keep him quiet and protect the eyes when down; then a rope is placed round the girth with a ring on either side; another rope with a loop on the end is put on the front feet, then doubled and passed back through the rings, which act as runners. Then the hind feet are put in and a pull forward is given, the horse going down easily on his knees. Pull the feet up together, put a half hitch on both, and then bring the rope round the rump, to keep the legs from forcing upwards, as sometimes occurs under the old method. When tied in this way there is no danger of the man at the colt's head being struck by the front feet. Members thought there was danger of injury resulting from frosty weather if the colts are castrated too early. The Hon. Secretary did not believe in tying the front legs at all, as the colt would struggle less if the fore legs are free. He had never known anyone hurt by the fore legs when holding the head, while the animal had less leverage to struggle and strain himself than if all four legs are tied together.

GREEN FODDER.—Mr. Tiller tabled bundles of rye and Gluyas wheat, about 2ft. 6in. high, and not yet out in ear. The Hon. Secretary tabled plants of Johnson or Aleppo grass for distribution.

Pyap, September 18.

Present—Messrs. E. Robinson (chair), J. Holt, H. Mills, C. Billelt, B. T. H. Cox, A. J. Brocklehurst, W. Axon, A. Westbrook, J. Napier, J. G. McGough, W. C. Rodgers (Hon. Sec.), and one visitor.

DEEP SOWING OF WHEAT.—Mr. Westbrook tabled plants of wheat from seed sown to depth of nearly 6in. Below the grain were a few roots, and above a thin stalk, which threw out a number of roots within an inch or so of the surface of the soil. He wished to know whether this tap-root

was a feeder or otherwise. He favored deep sowing, especially on sandy soils, being of opinion that the lower set of roots would feed the plants in dry weather. Mr. Brocklehurst was of opinion that the main roots were those close to the surface, and that it was unnecessary to sow deeply. He thought the grain had already done its part in the production of the plant, and that the main set of roots would either feed the lower or the latter would die off. Considerable discussion on the use of the two sets of roots ensued.

Mylor, September 21.

Present—Messrs. W. H. Hughes (chair), T. J. Mundy, F. R. Newberry, E. J. Oinn, E. W. Hayley, J. Nicholls, J. Roebuck, W. G. Clough (Hon. Sec.), and five visitors.

Ducks.—Mr. Hughes read a paper on this subject to the following effect:—

He did not exactly make a profit out of his ducks last season, but was so satisfied that there was money in them if properly managed that he was going to keep at it. Last season he purchased some Indian Runner ducks as well as some very large Pekins and Rouens. He got about 2,000 eggs, and reared a considerable number of birds. He found it cost on the average, buying everything, 4d. per week to feed three ducks. With eggs at 7d. per dozen during the laying season—four eggs per duck per week—this will pay, but if one has to pay 4d. per week for feed during the eight months when only few eggs are laid there is no profit in it. Although the Indian Runner ducks average more than four eggs per week each, the margin was not large enough, and he had given up the idea of making egg production pay. With the Pekins and Rouens he intended to go in for rearing ducklings for sale. One rears of ducklings at eight weeks weighing 5lbs., but he was not able to manage this. He gave them all they could clean up several times a day—five times daily with youngsters, and two or three times as they get older. He would change the feed often, varying it as much as practicable. Bran, pollard, copra cake, boiled or unboiled wheat, boiled cabbage leaves, turnips, etc. These can be given separately or mixed together, or sometimes one and at other times a mixture. He believed a young duck could be fed for sixteen weeks at a cost of 1s. He had sold during the past season over 100 at this age at 4s. and 4s. 6d. per pair, showing a profit of 1s. to 1s. 3d. per duckling. This leaves a good margin for trouble, feed of parent birds, hatching, and other expenses. Besides there are the eggs obtained during this time. The manure too is of value; if the birds are kept within hurdles on the cultivation plots and followed up with spade or plough the land will greatly benefit. He found the Pekins grew fastest at first, and for ducklings they would be most profitable, but for young ducks at four months the Rouens weighed heaviest. At this age he found the birds are fully feathered, and give general satisfaction. Buyers do not seem to care for a duck that has laid, but he did not know why. He would advise beginners to get as large birds as they can, and to try for fat ducks at sixteen weeks, as he believed there was money in it.

Considerable discussion ensued. It was the general opinion of members that ducks will pay in this district. Mr. Hayley was strongly of opinion that at present prices they would not pay, and that the food, if given to pigs, would give a much better return.

Caltowie, September 23.

Present—Messrs. N. E. Hewett (chair), A. Kerr, A. McDonald, A. McCallum, M. E. Wilson, S. Wenham, J. Potter, J. Neate, G. Petatz, J. H. Both, and F. W. Lehmann (Hon. Sec.).

CONGRESS.—Delegates to the recent Congress in Adelaide reported on the proceedings at the various meetings at which they were present.

DO TREES ATTRACT RAIN?—Paper read at Brinkworth Branch by Mr. A. L. McEwen was discussed. Mr. McCallum considered the presence of large numbers of gum trees induced rain. Mr. Wenham also believed that trees attracted rain. Mr. Kerr believed that other natural conditions affected the question of rain, and not the presence of trees. The Flinders Range had more trees than the Never Never country, but a lighter rainfall. He did not

think anyone could prove that the presence of trees had anything to do with the rainfall. Timber was cheaper now than it was twenty-five years ago; other members, however, held a different opinion on this point. Mr. Potter stated that the rainfall in the Never Never district was less now than it was thirty years ago. Mr. Hewett thought it might be difficult to exactly prove that trees affected the rainfall, still he believed where there were big belts of timber the rain would fall more plentifully than elsewhere, and in this opinion the majority of the members agreed.

Angaston, September 21.

Present—Messrs. F. Thorne (chair), A. Friend, J. E. Swann, P. Radford, S. O. Smith, F. Salter, A. Salter, R. Player, J. Vaughan, and J. H. Snell.

CONGRESS AND SHOW. —The Chairman reported very fully on proceedings of Annual Congress, the meeting of fruitgrowers to consider the question of freights, and the visit to the Produce Dépôt and slaughter yards. Mr. Smith reported on matters of interest at the Royal Agricultural Society's show.

SEASONABLE OPERATIONS.—Mr. E. S. Matthews (Hon. Sec.) forwarded the following notes on gardening work:—

Now is the best time to sow water, sweet, and rock melons, in new land if possible; bush marrow, white trombone (Jonathan); also cucumbers (Bedfordshire and Stockwood's Ridge). Peas and beans may still be sown, and, if mulched and the ground kept well hoed, with every chance of success. Broad beans should be gathered young; when old they can be dried. Sow French beans—Canadian Wonder is the best and most reliable variety for use; also runner bean (Giant White Caseknife). Let French beans go when they begin to show the yellow leaf at the bottom, and fall back on a later planting. If this is not done much valuable time is wasted. Small and successional sowings of these are much preferable to a large and only sowing.

Potatoes which have been previously spurted can now be planted. Earthing of potatoes is absolutely necessary, though I have seen gardening notes in horticultural journals state otherwise. For present planting prefer Early Rose and Beauty of Hebron; small setts and single spurs.

Rhubarb will often show signs of seeding; this should be carefully removed.

Cabbage—Early York and Early Express can still be planted out; both varieties can be planted closely together.

Summer or round spinach should be in every garden; it is a grand medicinal vegetable. New Zealand spinach is a fairly good summer substitute, and stands the drought well.

Tomatoes should now be put out and given but little water; otherwise they will make growth at the expense of fruit. I prefer trellising to allowing them to lie on the ground; when trellising cannot be done brushwood can be laid for the plants to trail over.

Everyone should plant passion fruit; also Logan berry. There is a great future for the latter for jam-making.

Lettuce can be grown for salad and out young; and mustard and cresses can be grown by everyone.



INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

Number of Persons Registered and Found Employment by Government Departments and Private Employers from August 30 to September 28, 1901.

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youths	81	132	256
Masons and bricklayers	3	1	5
Carpenters and joiners	7	2	3
Painters	1	2	1
Plumbers, ironworkers, &c.	4	—	2
Blacksmiths and strikers	3	1	—
Boilermakers and assistants	1	1	1
Iron and brass moulders	1	1	—
Fitter and turner	5	0	1
Miners	2	—	—
Compositors	2	—	2
Bookbinder	1	—	—
Caretakers	—	—	2
Warders	2	—	—
Pipelayers	1	—	2
Chainman	1	—	—
Lineman, &c.	1	—	—
Tentmaker	1	—	—
Mattressmaker	—	1	—
Stonebreakers	—	—	3
Camel-driver	—	—	1
Gardener, boots, &c.	—	—	2
Apprentices	17	—	3
Cleaners	8	4	—
Junior porters and porters	17	10	3
Rivet boys	2	—	1
Totals	161	155	288

September 28, 1901.

A. RICHARDSON, Bureau Clerk.

The Factories Acts.

CONTRIBUTED BY CHIEF INSPECTOR BANNIGAN.

(Continued from page 203.)

Any Board, instead of specifying the lowest piecework prices or rates which may be paid for wholly or partly preparing or manufacturing any articles, may determine that piecework prices or rates based on the wages rates fixed by such Board may be fixed and paid therefor, as provided in the next following section.

Any person who, pursuant to such determination, fixes and pays piecework prices or rates shall base such piecework prices or rates on the earnings of an average worker working under like conditions to those for which the piecework

prices or rates are fixed, and who is paid by time at the wages rate fixed by such Board, and shall, if required by the Chief Inspector so to do, forward a statement of such prices or rates to the Chief Inspector.

Any person who, having fixed a piecework price or rate, either directly or indirectly or by any pretence or device, pays or offers, or permits any person to offer, or attempts to pay any person a piecework price or rate lower than the price or rate so fixed by him shall be deemed to be guilty of a contravention of the Act.

In proceedings against any person for a contravention of the provisions of sections 27 or 28 the onus of proof that any piecework price or rate fixed or paid by such person is in accordance with the provisions of such section shall in all cases lie on the defendant.

The occupier of every place where a process, trade, or business to which the determination of any Board applies is carried on, and which is not registered as a factory, shall register with the Chief Inspector his full name and the locality (giving the name of the street and the number, if any) of such place, and the provisions of Part I. of the Act shall apply to every such place, and to the occupier thereof, as if in such part the word "factory" included a place where such process, trade, or business is carried on; and with regard to such place and occupier thereof, and his agents, servants, and employes, and the books, register, and documents therein, every Inspector of Factories shall have the like powers as such inspector would have had if such place had been a factory.

Where any persons or classes of persons are employed by any employer in preparing or manufacturing articles, the lowest prices or rates of payment for preparing or manufacturing which have been determined by a Board, then, if so directed by the Governor, any Board shall also determine the lowest prices or rates of payment which may be paid by any employer to such persons or classes of persons for wholly or partly preparing or manufacturing, either inside or outside a factory, any particular articles whatsoever.

Where a piecework price or rate or a wages price or rate has been fixed by the determination of any Board for wholly or partly preparing or manufacturing, either inside or outside any factory, any articles, or for doing any work, no person shall, either directly or indirectly, require or compel any person affected by such determination to accept goods of any kind or description in lieu of money, or in payment or part payment for any work done or wages earned, and the receipt or acceptance of any goods shall not be deemed to be payment or part payment for any such work or for any such wages.

Where any employer employs any person who does any work for him for which a Board has determined the lowest price or rates, then such employer shall be liable to pay, and shall pay in full, in money, without any deductions whatever, to such person the price or rate so determined; and such person may, within twelve months after such money became due, take proceedings in any court of competent jurisdiction to recover from the employer the full amount, or any balance due in accordance with the determination, any smaller payment or any express or implied agreement or contract to the contrary notwithstanding.

The Governor may, by order published in the *Government Gazette*, direct that any Board may, in any regulation, determination, order, or instrument, or legal proceedings, be described for all purposes by some short title to be specified in such order.

Any person who, either directly or indirectly, or by any pretence or device, requires or permits any person to pay or give, or who receives from any person any consideration, premium, or bonus for engaging or employing any female as an apprentice or improver in preparing or manufacturing articles for clothing

or wearing apparel, shall be guilty of an offence, and shall be liable on conviction to a penalty not exceeding £10.

When any Board has fixed a certain wages price or rate for a stated length of time each day, then the wages price or rate to be paid for any longer or shorter time worked shall be not less than a proportional amount of such price or rate.

Where by any determination of a Board both a piecework price or rate and a wages price or rate are fixed for any work, the piecework price or rate shall be based on the wages price or rate; but no determination shall be liable to be questioned or challenged on the ground that any piecework price or rate is a greater or less amount than such price or rate would be if based upon the wages price or rate.

No person whosoever, unless in receipt of a weekly wage of at least 4s., shall be employed in any factory, or in wholly or partly preparing or manufacturing any article for trade or sale.

No person shall pay or return to his employer, and no employer shall accept or receive back, any part of any weekly wage by way of premium or otherwise.



Journal of Agriculture

AND

Industry.

No. 4. REGISTERED AS NOVEMBER, 1901. [A NEWSPAPER. Vol. V.

NOTES AND COMMENTS.

The past month has been the wettest October for several years. The weather about the end of September and the early part of October was not too promising, being warm and dry, but on the 10th of the month rain set in and soaking showers were experienced throughout the agricultural areas. Further splendid rains were experienced from the 26th to 29th, up to 2in. being recorded at many stations. This will greatly benefit the crops that are now in ear, and will bring on the later crops. In most cases it came too late to make a material difference in the hay crops, which, on the whole, will be considerably lighter than last year. The wheat crop is estimated by different authorities to promise twelve to thirteen millions of bushels, providing nothing unforeseen occurs; but it must be remembered that a wet October, besides being favorable to the growing crops, also produces the conditions most congenial to red rust, *i.e.*, warmth with moisture. In a number of districts red rust has already appeared, so that it will be seen the danger from this scourge is imminent enough to be unpleasant.

Some time since a correspondent, writing to one of the daily papers, stated that the cost of the present system of fruit inspection amounted in South Australia to £8,000. Whether he desired to create a sensation, or simply made the mistake of adding a cipher to the figures, it is impossible to say; the Blue-books, Estimates, and other papers published by the State would in any case have shown the mistake. As, however, this statement has been used by others, too lazy to inquire for themselves, to show how burdensome (?) is our system of inspection, it may be interesting to quote the exact figures. The total amount provided for the current year for horticultural instruction, inspection of imported and exported fruits and plants, and inspection of orchards is £1,080, of which a considerable amount, say £150, can fairly be debited to horticultural instruction. Against this expense the revenue from inspection and fumigation fees will probably amount to nearly £300, so that the net expense incurred in measures necessary to prevent the introduction of diseases or insects affecting fruit or plants, examining fruit for export, and inspecting orchards in connection with the codlin moth regulations does not exceed £600 per annum.

In Argentina the lime and sulphur dip is largely used for scabby sheep. For a long time, it is stated, European manufacturers have been at a loss to understand why Argentine wools should behave so variably under exactly similar treatment. Very exhaustive experiments were tried, chemical analysis, &c., made, and the conclusion arrived at is that the trouble is due to the sulphur and lime mixtures used in dipping sheep. It is also stated that a lime and sulphur dipped fleece of wool is so permanently injured that no known process of manufacture and no known chemicals or other matter can restore it to its natural healthy condition.

Mr. E. C. Kempe, of Peake Station, Warrina, writes to the *Australasian Pastoralist's Review* that the Angora goats on that station have increased and are thriving, and now number 1,000 head. These goats are descended from the late Mr. Price Maurice's pure-bred flock, and the change to the dry bush country with the continuous sunshine appears to have had a beneficial effect on the flock. The goats are more prolific and cut heavier fleeces than formerly. The goats are hardier than sheep, and some country will carry far more goats than sheep to the mile. Each pure-bred goat returns from 4s. to 6s. net per annum. The meat of the half-bred Angora is much superior to "old ewe" meat. Mr. Kempe asserts that the Angora is a profitable animal, and that there will be a strong demand for them shortly. Generally in Australia they have not been tried in suitable country. They do not care for grass; like bush and hot sunshine, and hate wet.

Would it tend to the advantage of our fruit exporting business in Westralia were the consignors of fruit to combine and employ an agent at the port of arrival to see that the whole of their fruit is carefully handled right through from the ship to the wharf, and from the wharf through the hands of the inspectors, and particularly through the hands of those who unpack and repack the fruit in the cases? Could it be managed that the exporters' agent could have recognition both by our own Government and that of Westralia? Suppose each consignor had marks on his shipments, showing by what grower the cases of fruit were packed in this State, would the agent in Westralia be in a position to describe the condition of the fruit on arrival? It may happen sometimes that an exporter cannot find time to see every case of fruit packed in the orchard where grown, or elsewhere, and if the top layer of each should be clean and perfect, and the rest diseased and generally objectionable, it might tend to improvement of our export fruit trade if the fraud were exposed.

Until fruit begins to become tempting to fowls it would undoubtedly be a good practice to turn in as many fowls, ducks, and turkeys on the orchard or vineyard as can be got together. They can do no harm then, but they will catch innumerable insects that would injure the trees and vines. Many beetles and caterpillars crawl on the ground from plant to plant—the curculio, for instance. Ducks will work at night if they are shut up during the day. In this case they should have a good feed in the morning. Fowls of other kinds should have their principal meal in the evening and a very light one in the morning. By following this rule the active co-operation of both classes will be secured in the war against insect pests.

If fruit affected by codlin moth caterpillars is placed in bags and immersed in water for a period of forty-eight hours the caterpillars will be either drowned when they leave the fruit or be smothered in their burrows. There is the danger of the caterpillars crawling out of the tank and thus escaping death. To prevent this most authorities recommend a close cover, which is a good thing; but a better precaution would be to pour a wineglassful of some cheap oil—colza or teileseed, for instance—on top of the water. If the bags are completely immersed, as they should be, every caterpillar would have to pass through the film of oil, which would completely destroy the insect.

It is not generally known that two crops of cabbages can be obtained from one plant, and perhaps if it were known there are few besides small growers who would practise the art. When a good cabbage has been produced, cut it off without disturbing the roots; split the stump down nearly to the ground and continue to cultivate the soil as usual. After a short time several buds will form, all but one of which on each piece of stump should be removed. The solitary bud will develop a fine head, which can be cooked. If all the buds are left after the first cutting, seeds will be produced, and these will be as good as if raised from the first head, provided they are not crossed with pollen from inferior plants.

The Chairman of Arthurton Branch of the Agricultural Bureau lately took exception to the General Secretary's statement "that owing to the destruction of timber our seasons had altered and were later than formerly." His experience was that wheat seemed to ripen quite two weeks earlier, and in the fruit gardens he noticed the same thing in respect to earlier ripening fruits.—The General Secretary wants to know if this is the reason why the "February" show in Adelaide has been deferred until March and renamed "Autumn" show? Much attention has of late years been devoted to early-ripening wheats and fruits. In the first days of South Australia we used to have water-melons and forty other fruits at Christmas. Why are they absent now?

Where the land is denuded of trees or shrubs or grass and herbage the rain-waters flow away quickly to the lowest levels. This loss of moisture in the soil is not the only loss. The water that ran off carries away a lot of dissolved plant food, as well as light substances that would ultimately have decayed and formed plant food, humus, &c.: and that would have helped to maintain the necessary good loose "mechanical" condition of the soil. The continuous glaring heat of the sun upon the bare surface slowly changes the organic matters in the soil, and humus disappears; the wind carries away the surface in the form of dust, which, being largely composed of decayed organic matter, still further impoverishes the land. On such bared surfaces the young grass is exposed to frost, and grows slowly, and the absence of the old grass amongst it is not conducive to the welfare of the animals fed on the land.

Most people would think that if a purchaser asked a dealer for a certain article and paid the full price for it that he would be defrauded if the vendor supplied him with something that was not the article demanded and paid for; but there are some manufacturers who maintain that there is no dishonesty in

supplying a mixture of certain fruit pulps, flavored with "raspberry essence" and mixed with rotten figs or tomatoes (to supply seeds), in lieu of raspberry jam; or a mixture of vile acids and colorings in place of pure vinegar; or another mixture of acids and flavors for limejuice; or a re-fermentation of grape skins with glucose and water in place of "chablis," or other wine. They say that it does not matter so long as the purchaser is not aware of the substitution. Other men buy up cigar-boxes bearing labels of first-class makers, and refill them with cigars of similar shape, but vastly inferior quality: but this is not—by these honest men—considered to be wrong, although they would not like the matter to be mentioned. There is a lot of this sort of honesty about.

There are clean, careful, and honest people in the world, and there are people who display a good deal of the opposite characteristics. For the protection of both classes of people it has been found necessary to enact laws compelling the dirty people to be clean, to make careless people more attentive to orderliness, and to force the rogues to be honest—with the alternative in each case of some more or less severe punishment. To enforce observance of those laws certain officers must be appointed, and it is only the reasonable duty of every clean, careful, and honest person to cheerfully submit to the necessary supervision exercised by those officers, and to aid them in every possible way. When anyone fails to do this it is only reasonable to suppose that the objector has something that he wishes to conceal—something that will not bear inspection and inquiry—or that he would not like to see the light of day.

The reason why Denmark has so rapidly jumped into prosperity in the butter-making industry lies in the fact that all dairies have been regularly visited by dairy instructors, who also act officially as dairy inspectors. These men are not regarded by the farmers as tyrannical inquisitors, but rather as benefactors. Many of these travelling instructors are Government officials; but each of the principal factories maintains its own inspector and instructor, who regularly visit the "patrons," inspect everything about the dairy farms, advises in respect to feeding the stock, watches the health of the animals, direct how they are to be treated, and has power to insist that his directions are obeyed. It is very rarely that he has to put his "powers" into force, because everyone recognises the fact that all the advice offered and every direction given is distinctly for the advantage of the people to whom the advice and directions are given.

In the Camperdown district of Victoria three dairy factories distributed to milk suppliers during the year ending June 30, 1901, the sum of £157,000. The Camperdown factory purchased 3,320,140galls. of milk, the Glenormiston 2,908,265galls., and the Cobden 2,209,820galls. In addition to these three large factories there are six smaller ones, so that the distribution of money from the dairy factories alone must reach considerably over £200,000 per annum. When the returns from the by-products, *i.e.*, calves, pigs, poultry, &c., and from milk or cream sent out of the district are also taken into consideration, it will be seen that the district in question is enjoying a marked prosperity through the development of the dairying industry.

It is estimated that the value of poultry and eggs produced in the United States reaches the sum of £80,000,000 annually. Among the agricultural industries poultry is about fourth in position, only maize, wheat, and dairying ranking above it. The great live stock purchasing and meat-packing establishments have added poultry-packing to their businesses, and are buying poultry and eggs on a large scale and opening up new markets. The live poultry is bought and sent to centrally-situated places, where it is dressed and held in cold storage for market, being distributed in such quantities as not to glut the market at any time. This has greatly stimulated the production of poultry and eggs, and poultry farms are increasing rapidly in numbers.

A few years since the Agricultural Bureau imported a quantity of seeds of cow peas, and these were distributed all over the State. In most instances failure was reported; in some cases the summer was too hot and dry; in others the seeds were sown too early in the season and the plants destroyed or checked by frost and cold. This plant is a true bean, and should be of considerable value in the moister portions of the State. The green pods of some varieties can be used instead of French or kidney beans; the dry beans as haricots, and also for feed for stock; for fattening pigs they are of special value. Cow pea hay is most nutritious. It is, however, as a green manure crop that they are most largely grown and are of the greatest value. From analyses by various chemists, the manurial value of a crop of cow peas varies from £3 to £8 per acre according to the rigor or otherwise of the growth. The land for cow peas must be deeply worked and be fairly moist. Seed must not be sown until the warm weather sets in, when French beans would be sown out of doors. Seeds should be drilled in about 15in. to 18in. apart in rows 30in. apart, and the weeds kept down until the plants commence to run. As the plants are deep-rooting they will stand a lot of dry weather once established. Market gardeners and others who require to grow crops for turning under would do well to try the cow pea. Three months or a little longer after sowing the seed the plants will be in the best condition for green manure—the pods should be just forming.

Experiments conducted during several years at Ontario Agricultural Department grounds have shown that potato setts sprinkled with calcined gypsum gave heavier crops than setts planted without sprinkling. Cut potato setts gave heavier crops when planted at once than when kept five days. Potatoes planted at 26½in. apart gave better crops than when planted at 33in. apart. Single setts in each place gave more crop than where two or four setts were planted together.

An old bushman gives a good "wrinkle" in poisoning wild dogs, which will also probably serve for foxes. He prepares a large number of baits in the usual way, and provides in addition a number of fresh bones, to each of which he attaches a piece of wire. A hide or other "drag" is drawn along the track, and the baits are dropped at intervals. One of the bones is attached by the end of its wire to a mallee or other tree or shrub near to a bait. The dog eats the bait, sniffs around and finds the bone, which he proceeds to gnaw instead of following the trail and eating more baits. By this method many more dogs are killed and fewer baits are required.

FOREST PLANTING AND TIMBER SUPPLY.

BY F. E. H. W. KRICHAUFF.

No. 1.—Is South Australia doing Her Duty to Posterity?

In June, 1875, I read a paper before the Chamber of Manufactures with not quite the same heading. It was "Forest Conservancy and Timber Supply." for twenty-six years ago there was yet considerably more native timber trees that were worthy of protection from the axe and fire. Now such a course as mere protection must be supplemented by new plantations of very great extent to make good what the first settlers destroyed, frequently without necessity or forethought. In supplying the wants of the present generation there has been frequently the most reckless waste of what cannot be called forth at will within a few years. And, after all, I consider that we had only a life estate, with no permission to waste, in the native-grown forests of this country; and those who come after us can claim at least a full equivalent in young plantations, by which we may protect them against a great advance in the price of all timber and firewood and a deterioration of climate. The planting is certainly important from a financial point of view, but the hygrometrical conditions of the atmosphere in which South Australians are to live should, if possible, be improved, not made worse.

I am much pleased that lately more interest has been shown in the growing of forest trees by not a few of our Branches of the Agricultural Bureau. Although this awakening may not lead to large plantations, absolute indifference by the great majority of the inhabitants of this State does not contemplate even the ultimate results of further neglect. What Mr. Gill at present can do under Government is, after all, not what I, and I hope many others in South Australia, desire to see. We require not hundreds of acres annually planted; many thousands only can ensure even the smallest success. Yet the total area enclosed for planting operations and encouraging natural reproduction of trees up to June 30th, 1900, was only 13,459 acres out of 215,434 acres of our forest reserves. True, during the last eighteen years, we are told, 4,850,801 forest trees have been distributed free to 20,892 persons, but how many of these are alive, and how many actually growing to advantage? Even our indefatigable Conservator of Forests has frequently only 60 to 75 per cent. of the planted trees doing well. If one sees some of the older, not the oldest, plantations near Jamestown, or the photograph of the eight-year-old sugargums at Redhill, one is sorry that there are not thousands of acres like them. Of course this could not be done with a parliamentary vote of under £6,000, irrespective of a few hundreds as special votes. The actual revenue from timber is as yet very small, but with the rents and grazing fees one-half of the parliamentary vote is recouped to the public purse. Every additional £1,000 would greatly increase the area planted, as we have the staff that doubtless would require only a very small share of such sum. For the year 1899-1900 159 acres were planted; how can this, in addition to any small plantations by private owners, supply eventually one year's supply of firewood and timber, much less benefit our climate? The quantity of firewood used in our present 75,854 houses is, notwithstanding our mild winter, proportionately large, and may average 4 tons of fuel, or an annual total of more than 303,416 tons. What manufactories, railways, and mines may use of firewood we may set off against the use of coal in households; and what the above require as timber cut in South Australia is unknown, but must be considerable. Dr. W. Schlich, a forest expert, in an address at the London Society of Arts, predicted a positive timber famine in the near future, as more and more wood was being used in spite of coal and replacement by iron in buildings. Fourteen cubic feet are now consumed annually

per head by the four chief countries of Europe, and this ratio is constantly rising. Natural growth cannot nearly keep pace with the demand, especially for soft wood, such as pines, since the limit of production has been reached in Scandinavia. Russia and Canada can yet export, but how long can we depend upon them, where thirteen countries import more than they export, and our former stand-by from the United States is visibly declining, as I shall fully explain in a later article. Dr. Schlich finished by stating "that country that first engages in systematic timber cultivation on a large scale will do much to assure its own perpetuity as a (I say wealthy) nation."

I may here insert Reichert's opinion as to the present distribution of forests in a great many countries, viz.—Russia and Sweden possess about 42 per cent. of their area, Austria 31 per cent., Germany 26 per cent., Norway and India 25 per cent., France 16 per cent., Portugal 5 per cent., Great Britain and Ireland 4 per cent., Cape Colony 0.29 per cent. under forests. Parts of South America, Siberia, and Central Africa remain the chief sources of supply for the near future.

Much as I value and respect the expression of opinions and the papers prepared by members of our Branches, I cannot understand where Mr. McEwin, of Brinkworth, can have obtained his information as regards the price of firewood in Adelaide, which he says is cheaper than thirty years ago. He also tells us that timber trees are more plentiful in the South-East, and that these had nearly doubled of recent years in South Australia. Alas! I wish this were correct. Some of the members of the Caltowie Branch agreed that timber was cheaper than twenty-five years ago. Certainly not timber grown here. Against these assertions says Mr. Jose, of Port Pirie Branch, that 80 to 90 per cent. of the original covering of the soil with timber and thick bushes has disappeared, and that the wasteful process still continues. He advises extensive tree-planting. Mr. Dolling, of Port Broughton, also, in desiring to see this accomplished, wishes, as an object lesson, 100 acres planted in each hundred. A forest nursery and plantation has been the wish of the Carrieton Branch for many years. Mr. Schinckel, of Naracoorte, and Mr. Dow, of Lucindale, answered for the South-East by advocating the planting of forest trees for such bleak districts. Mr. Wardle supported, and Mr. Buck referred to the beauty and advantage of such a plantation on the Bald Hills, on Mr. Pustkuchen's farm. Mr. McEwin could also have noticed years ago mile upon mile of dead trees in the South-East, killed by some unexplained cause, except we agree with Dr. Thomson—to me, startling theory—that it was an effort of an exhausted nature to effect a change of timber.

On the whole question of forests Mr. W. Gill, F.L.S., Conservator of Forests, wrote in 1897-8 seven articles for our *Journal*; and Mr. A. Molineux, F.L.S., addressed the Mallala Bureau in July, 1899; while Messrs. J. C. Symons and W. Natt, of Crystal Brook, set the ball rolling in May, 1900; Mr. H. J. Spencer, of Nantawarra, following in July, 1901. Arthurton, Boothby, and Millicent ventilated the subject, and were anxious to obtain seeds of forest trees, to rear them; while Cradock desired to have Rocky Waterhole Paddock reserved, where thousands of young pines had made their appearance. I hope these pines have been saved, as such self-sown forest trees are generally preferable to any that are planted.

But there is a money-grubbing population in Australia. As Mr. Ruskin says, "We observe the face of nature too little, that the few enthusiasts who have come to know her speak to us, when they describe her beauties, in an unknown tongue." Australians want to know whether forests will pay! That must be shown to them, and that the nation's welfare demands plantations. I have known a gentleman in the city of Adelaide who had £100,000, or more, on mortgages, the greater number over country securities, but had never been out of the city as far as Mount Barker. Our forest-crowned hills gave him no

pleasure; he was like a Virginia creeper, or an ivy clinging to the walls of his domicile; folded the leaves (of his books) at night, and spread them open in early morning, like a locust tree and some others. He seemed to have forgotten that, as a human being, he had the power of locomotion, but he was almost as immovable as a firm-rooted large tree. There are, however, very large numbers of our colonists who may enjoy a picnic, but they will see without any pity the finest trees felled elsewhere by the axe of the farmer or lumbermen. If these persons had more of the fancy of the old Greeks—that living creatures had their abode in the trees—they would perhaps have a more tender feeling for them, for they are none the less alive, loving light and sunshine, make a choice of their food unerringly, and their roots overcome great obstacles to obtain the kind of food material which the particular tree prefers and either a dry or wet position. These persons should make better colonists than merely to cram themselves or their children with a certain amount of knowledge enabling them to make money as easily as possible. Of course there is profit as well as pleasure in tree-growing, although it may require growers to be unselfish enough to leave most of the profit for the benefit of posterity, for they should leave the country in as good or a better condition as they found it themselves. They will themselves derive some benefit from planting a considerable number of trees, irrespective of the thinning of their forest, as Dr. J. T. Rothrock, State Commissioner of Forestry of Pennsylvania, says:—"Each acre of forest (meaning one out of 7,360 acres) can, in the growing season, give back to the air about 14,000 tons of water by evaporation or transpiration, if you have planted long-lived trees. You help to protect and produce the grain also on which your grandchildren will live." And it must be admitted that here also the more successful cultivation of many crops is more or less dependent upon the protection by trees. My hope is that this article and a few more on forests will call still greater attention in our State to the beauty and special value of forests. They had been rather sparsely provided by nature, and of this supply we are certainly neither careful, nor do we secure to us and our children a reparation for the use made by us, much less do we earnestly try to supplement manifold what nature had not even presented to the first settlers. Our Government has now, I might say, experimented long enough on a fairly large scale, testing a large number of forest trees and their adaptation to many parts of this State, during a quarter of a century; and it is now about time that really large areas of our forest reserves be planted, and valuable experience gained by the staff applied without the fear of making costly mistakes.

Will our Commonwealth Government reserve any considerable portion of the land around the federal capital as forest land, and cause it to be planted and treated on the most approved rules, is also a question which our senators and representatives may consider before it is too late?

DAIRY INSPECTION.

By G. S. THOMSON, N.D.D., GOVERNMENT DAIRY INSTRUCTOR.

The subject of dairy inspection has been discussed freely of late, and amongst dairy farmers and others associated with the industry adverse opinions have been publicly given against the appointment of an inspector. Why the farmers should take this view of the matter is probably due to their misunderstanding of the duties such an officer would be called upon to fill; but before explaining this, let it be understood that until efficient inspection is put into force the dairying industry of South Australia will never secure a thoroughly sound footing. Carefully-organised inspection will go to the root of the evils of the industry—contamination of the milk supply—and until this

end is effected the quality of butter and cheese will have to face an unconquerable foe. Surely farmers will agree with me in that respect. It is obvious to everyone who takes a broad view of this very important question that the factory manager cannot be expected to turn out choice produce when the milk supply is acid and tainted or the cream old and stale and otherwise unfit for conversion into good butter. To provide the State with assistance we have not advocated an army of inspectors to possibly override their duties and cause annoyance to the farmer, but what has been recommended is the appointment of a thoroughly qualified practical and scientific man, who would visit farms and give advice on dairying matters generally, with special instruction for the better handling of milk and cream. The inspector would work in conjunction with the factories and the Government d^e-pôt, and there is no reason to doubt that his acceptance at the farms would be of a harmonious nature and his labours of much profit to our valuable industry. Why I should recommend such an inspector is because my experience in the State in the handling of dairy produce, in the investigation of taint in butter and cheese, has proven to me that much of the heavy losses that our farmers and factories sustain can be averted if proper precautions were adopted and more instruction given on the farm. And this is not all, but much laborious scientific work in tracing taints would not be necessary, and more time would be available to do other educational branches which have been neglected in the past. In dairying and dairy-farming we have an industry of so extensive scientific connection that every branch of agronomical science plays a part in the success, and unfortunately this is but poorly understood by those outside of the practice of the farm. I would willingly conduct the inspection of the State, but it is clear to everyone with a knowledge of the extent of my duties that such would be impossible to accomplish.

POULTRY NOTES.

BY D. F. LAURIE.

NOTE.—Letters of inquiry, &c., should be addressed to me, c/o Engineer-in-Chief's Office, Adelaide, enclosing stamped envelope if reply required.

Poultry Diseases, No. 2.

In the October number of the *Journal* No. 1 of Poultry Diseases appeared, and therein I dealt with several matters of great importance as indicating causes of trouble among poultry, and preventive measures to be adopted. On the principle that prevention is better than the cure I will proceed still further, and will now deal with

VERMIN,

the presence of which causes much loss both of profit and poultry.

Vermin, such as the small lice and fowl flea, cause much trouble not only with grown fowls, but especially among young chickens, resulting in great mortality. The absence of dust baths and general want of cleanliness on the part of the poultry-owner and neglect to whitewash the roosts and houses and apply kerosene or some other insecticide account for their presence. It is no argument to say that they are always to be found where poultry congregate, for this is not a fact. They can be exterminated, and, apart from my own birds, I have seen hundreds of others with no trace of vermin of any sort in the houses. Provide dust baths made of road dust, wood ashes, and a sprinkling of lime and sulphur or a little carbolic powder and the birds will keep themselves free in most cases. Certain birds, however, seem unable to rid themselves of vermin, and these must be treated separately. An application of insect powder, or oil and kerosene (two of former and one of latter are effectual), but bad cases,

especially where there are eggs of the vermin matted on the feathers, should be treated by washing the bird in warm water and soap, adding some good insecticide. Kerosene all perches, and pour it into cracks and crevices. Clean the houses out daily, and allow no accumulation of droppings and cast feathers. The following insecticides are good:—Cooper's sleep dip, Quibell's compound, Little's phenyle, Jeye's compound, Whalley's fluid, carbolic acid, kerosene, or, better still, crude petroleum. Keep a supply on hand, and use it freely; kerosene or petroleum renders woodwork very inflammable. There is another species of louse which is generally found on the bodies of weakly birds—grey in color, about a twelfth of an inch long, and sharp pointed both ends, movement rapid, congregate frequently near the vent; these, if allowed to multiply, will cause the death of adult birds. The tick, or bug (*Argas reflexus*), may also be classed with vermin, and is undoubtedly the greatest curse to poultry-breeders that they have. Unfortunately it has spread to many country districts, and is quite common in and around Adelaide; in fact, a yard free from it in the city and suburbs is a rarity. The poultry tick belongs to the *Argas Persicus* tribe, the Persian tick, and is of the spider family (*Arachnidæ*). It is a native of Persia, and is common in Texas; also in South Africa. It is unknown in Victoria with the exception of the far northern portions near the Murray. Tick breed during early summer with great rapidity; the eggs are laid in cracks and crevices, also on the feathers of the birds. If two pieces of wood overlap they will lodge between, and during breeding time if a large female tick be lifted up several small ones not larger than a small pin's head will be found—they are found ranging from specks up to a quarter of an inch or more in length. The eggs laid on the feathers hatch in a few days, and the young tick attach themselves at once to the birds, generally selecting the flanks and under the wings; they grow rapidly and appear as if under the skin. A wooden structure can only be cleared with an immense amount of trouble. Kerosene or some strong insecticide has to be syringed into every crack repeatedly, and nightly examinations must be made.

VERMIN-PROOF HOUSES.

The structure of the house should offer the least possible harbor for vermin of all sorts. I advocate iron with as little woodwork as possible; the woodwork should be free from cracks, and is better coated with hot tar. Complaints are frequent as to the heat of iron houses. This may be lessened by applying limewash, as follows:—Mix with boiling water $\frac{1}{2}$ gall. of quicklime to a thin putty, and add a handful or small cupful each of sugar and salt, and put on while hot. Two or three coats may be required. Messrs. Sandford & Co. have brought under my notice the merits of ruberoid as a roofing and covering material. I am erecting a couple of poultry houses, a lean-to and a wigwam shape, and will give the results of my investigations in a month or so. It is claimed that this material is much cooler in summer and warmer in winter than iron, is very durable, and less costly than iron. It is possible to construct houses of it without woodwork.

PREDATORY ANIMALS.

Much loss frequently occurs from rats, domestic cats, dogs, native cats, crows, magpies, hawks, and, in parts, the fox. It will be well in such districts to at any rate provide sleeping houses which can easily be made proof against them. Rats are about the most difficult to deal with. Gas tar poured into their burrows will, as a rule, drive them away. A sharp terrier will deal with cats, and where hawks abound erect a pole 10ft. or so high, nail on a flat top, and put a rabbit trap there; hawks generally perch on such a position in order to look round before they select their victim, and in such a case are caught. Crows are egg thieves; an old coat and hat artistically displayed will scare them till familiarity proves the scarecrow to be a comfortable perching place.

POULTRY COMPLAINTS.

In the following list of ailments some are not diseases, but are due to various causes. Such a case is

ABORTION, which is caused by sudden fright, or through the chasing or worrying of dogs or even other hens. The birds must be removed to a quiet secluded spot, and fed sparingly on plain food till recovered. The laying of shellless eggs, or of plain yolks without covering, is the result in some cases.

APOPLEXY, ending very often in paralysis, is due to overfeeding, especially in hot weather. The symptoms are generally the bird running round in a circle and falling. In some cases death is very sudden. Such birds as recover should not be used in the breeding pens. Over-fat birds should be fed sparingly to guard against this. In some cases apoplexy is due to hereditary weakness. Laying hens are frequently found dead on the nest; stimulating food should be avoided. Bleeding from the large vein under the wing, and allowing 4drms. to 6drms. of blood to escape, will give relief, with turpentine or strong tincture of iodine at the back of the head. In old show birds disorganisation of the kidneys is a predisposing cause, as well as fatty degeneration of the heart.

ASTHMA is one of the ailments grouped under the heading on "Roup." There is generally a difficulty in breathing. Steaming or fumigating with carbolic acid gives relief and very often cures.

BRONCHITIS offers similar symptoms, and is amenable to similar treatment.

BUMBLEFOOT is found in the heavier breeds as a rule, and, while often due to high perches and the jarring effect of alighting on hard ground, is often found on birds which do not perch. On the sole of the foot a large swelling will be found, generally with a shiny surface and inflamed and hot to the touch. The inflammation affects the upper surface of the foot, causing the scales to stand out. In the early stages, fomentation with hot water for several minutes and after drying with a warm cloth an application of eucalyptus, embrocation, or strong tincture of iodine may be resorted to with success; the length of time for effecting a cure varies. In advanced cases an operation is necessary. Wash the foot thoroughly in hot water, to which add some carbolic; with a sharp clean knife, first dipped in carbolic water (one in ten) make a deep incision right across and press out the contents—pus or thick matter. Wash out with disinfectant such as carbolic acid No 1. one part in twenty of warm water, or sanitas pure. Bandage the foot and twice a day carefully wash the wound and apply any of the following:—Carbolic oil, one part carbolic acid to fifteen of oil or vaseline, pure sanitas, or iodoform. If sloughing sets in and pus continues to form, open the cut again, wash out, and paint with ordinary tincture of iodine. The birds should be kept in a pen floored with sand or seaweed or some very soft material. The perches for heavy birds should not exceed 1ft. in height.

BOWELS, INFLAMMATION OF.—*See Enteritis.*

CANKER.—*See Roup.*

CATARRH is a cold in the head as a rule, and is often the forerunner of more serious trouble. The symptoms are puffed or swollen eyelids, eyes watery, a glairy discharge from nostrils, general dullness and disinclination to feed. Treatment: Keep the bird warm, feed on nourishing soft food flavored with the condiment No. 1, given on page 273 (October issue). If the disease progresses treat for roup.

CHICKEN-POX OR WARTS.—A disease prevalent during some seasons and affecting certain birds more than others. The head is generally attacked first, and the warts, or ulcers, soon spread and run together. An application of carbolic oil, one part carbolic acid and fifteen parts oil or vaseline is generally effectual. It may be necessary to repeat the application; take care that none

of this mixture enters the eye, as it would cause considerable pain to the bird. It is stated that sprinkling the roosting houses with chloride of lime wards off the disease during a time of epidemic, and also effects a cure in the suffering birds. Change the food, and add Epsom salts to the soft food. Mode: Dissolve a packet in sufficient hot water to mix the soft food for twenty adult birds.

(To be continued.)

Young Stock

should be liberally fed and kept growing. Do not overcrowd; give plenty of room both in yards and roosting house. Steamed bone for the growing stock will aid development and build up a strong frame. As soon as the cockerels develop comb and tail they should be separated from the flock and yarded by themselves; they will grow quicker, and will not harry the pullets. If left running with the hens and pullets they will sooner or later begin fighting, and damage will soon result. Where the space at disposal is limited, culling out the poor specimens should take place, so as to give more room for the good ones. This applies especially to high-class birds bred for sale, for exhibition, or breeding. In table poultry, all the forward birds should, as soon as well grown, be yarded separately and pushed on for sale as soon as ready. For laying, give forward pullets plenty of run and good sound food, so as to develop the frame and get them into profit in due time. These should lay when eggs are scarce.

Preserve all surplus eggs; those laid by unmated hens are the best. Use waterglass, dried salt, powdered charcoal, or, when gathered as soon as laid, grease with fresh lard, roll in paper, and pack on end in a box or tin. Keep in a cool cellar.

FURZE, WHIN, OR GORSE.

This plant is known to botanists as *Ulex europaeus*; but there are several species of *Ulex*, some of which might prove to be even more nutritious for sheep and other live stock. Scarcely any animals take to eating furze naturally, but when they have been driven to eat it through partial starvation they will even leave good sound hay for a feed of furze. In various parts of Great Britain this plant is known by different names, amongst which furze, whin, and gorse are the most common. *Ulex Hibernica*, or Irish furze, is more dense and upright than the common furze, and all its shoots are soft and succulent. Its spines or leaves are so soft and tender as to require no crushing or bruising in order to be catable by horses or cattle, and its flowers are few in number, so that seed could hardly be procured in sufficient quantity for farmer's use; but plants can be readily raised from cuttings, and permanent hedges and shelters could easily be established, where the sheep, horses, and cattle could browse and find shelter at one and the same time.

Furze will not thrive on cold clay, peaty, or swampy soils. It would thrive on sandy soils—probably very sandy—on gravels, and stony land, if not wet. It flowers abundantly, and is useful to bees; but it produces seeds profusely, and is liable to spread on to land that is wanted for other plants. The effect of furze upon thin, poor, gravelly, or stony soils is to add comparatively quickly to the depth of alluvium and humus. Furze is used as fuel by poor people, by bakers for quickly heating their ovens, by brickmakers, and others, and an acre of this plant is valued at 30s. to 45s. annually for those purposes in some parts of Great Britain. Furze is regularly and profitably cultivated in several parts of Great Britain, and also in New Zealand. In the latter country it is grown chiefly for sheep, and is mostly cultivated in long rows, which afford shelter to

the sheep whilst they are browsing on the plants. The old stuff is too woody, but to secure young growth the rows are cut back severely, or else burned every three years. In the latter case the land is resown. The growth is tender enough for sheep until it is three years old, so that if the plants are fed hard down there is no need for burning or cutting back. Sheep fatten on furze much better than on old dry grass. For horses and cows the furze is usually mashed or crushed in machines made for the purpose. Cows fed on furze produce as much and as rich milk as when fed on grass, and cattle and horses fatten on it. Although horses fatten, they do not work well on furze alone, and they should have some corn with it. They prefer crushed furze to hay, or even corn. Youatt says, "If 20lbs. of furze are given to a horse, 5lbs. of straw, the beans, and 3lbs. of oats may be withdrawn"; and Mr. Eddisson reckoned that a single acre well-cropped with furze will winter six horses.

The only way to use furze in the yard or stable is to bruise the prickles so that they will not injure the mouths of the cattle or horses. This can be easily done, either by the use of the furze mills, or by running it through the straw or chaff cutter and running a pair of old millstones on the chaffed stuff. The millstones should be bolted together, and run, like an old pug-mill, in a circular trough, by means of an axle and a centre post, or the spoil can be crushed with a number of stampers. A slower method is to lay the chaffed furze on a hard surface and pound it with a heavy rammer, the face of which is faced with iron-edged flutings.

FARM HINTS FOR NOVEMBER.

BY THE EDITOR.

Haymaking should be finished as soon as possible, and the stacks thatched to avoid danger from heavy rains, which are very likely to occur this year or season. The stacks should be placed in some place easily approachable by the teams, not in an ugly corner nor in a low place where the rain waters will collect. There should be enough dunnage beneath the stacks to prevent damage from below, and the haggard, or stack-yard, should be well cleared around to protect against fire, and fenced to prevent trespass by stock. Stacks should be away back from the road, to give tramps and loafers no temptation to frequent them at night for sleeping under. They should not be too far from the stables or from the dwelling-house, and yet not too near.

Those who put down silage will never repent that they did so. Even if there should be abundance of green feed after these late spring—or summer—rains, the silage will keep, or the green feed can be stacked as hay or ensiled. The time will come when the whole of it will be of the greatest value; or it can be used up in feeding or fattening a large number of animals.

Wheat harvested with the string-binder can be cut a fortnight before it would be ripe enough to strip. The grain will be better in every way, and the straw worth a great deal more for feeding stock than if it were left for a month longer on the field to lose most of its nutritious qualities. Many farmers are beginning to find out that it pays well to stack as much straw as they can get together, as well as to save all the chaff.

Over seventy years ago a farmer named Hannam, of North Deighton, in Yorkshire, England, conducted exhaustive and critical experiments to find which was the best time to harvest wheat. The details would occupy the chief portion of one issue of this present *Journal*; but the result in every case was that the grain that was reaped a fortnight before ripe was the best and brought the highest price. There was more weight, also, to the acre, and the straw was of greater feeding value than when cut at full-ripe stage. When reaped a fortnight before ripe the field looked green from a distance, but when

viewed closely was of a hue fast approaching yellow, and from a foot from the ground the straw was quite yellow. The ears, too, were more open, the chaff tinged with various shades of yellow and green, and the grain was soft and pulpy, but not sappy.

The straw of wheat is not always so well liked by stock as is that of barley and oats. The latter are softer and less flinty and harsh. But some wheat straws are preferred by stock to other varieties of the same cereals. Again, straws or hay grown upon gravelly or clay soils are undoubtedly more nutritious than those of the same varieties grown upon moist loamy land or those of a peaty nature. Straw cut when the grain is in a tough dough stage is much more valuable as food than when it is cut with dead-ripe grain; and the longer it is left the less nutriment will there be in it. Chaffed straw, when steamed for a few hours, and with a small admixture of grain and copra, or other cake, cannot be excelled as an article of food for stock. Long chaffing is better than short, because the animals ought to chew their food.

Mr. Stephens, author of "The Book of the Farm," mentions that a large coach proprietor in Edinburgh gives each of his horses a daily allowance of 8lbs. of chaffed straw and 16lbs. of bruised oats; another person gives to each of his large horses 10lbs. or 12lbs. of chaffed straw and 16lbs. of bruised oats. A common allowance in well-conducted stables in England consists of 11lbs. of chaffed hay, 2½lbs. of chaffed straw, 11lbs. of oats, and 1½lbs. of beans. In the French cavalry the rations include 11lbs. of straw, with varying portions of hay and oats.

If a horse, cow, or other animal were fed upon highly-concentrated nutritious food only for a short time it would soon become ill. Ballast, or bulky food, with a low proportion of nutrition is essential to good health; therefore a fair admixture of clean good wheaten straw is not only economical, but is beneficial and healthful for horses and cattle.

Chaff of wheat, or what we call "cocky chaff," is regarded in Europe as of very little value in feeding stock; whilst wheat straw is considerably used for that purpose, and always acknowledged to be useful and economical. The reason why wheat straw in Australia has acquired so poor a name for feeding value is that it is not gathered until the wheat crop is dead ripe, or even weeks after the grain has been stripped. By that time the straw has been bleached by the sun and weather, and probably more than half its food value has been destroyed. When the straw is harrowed down and raked off the field with clods, dust, stones, &c., it is not fit for food, possessing so little nutriment that the animals would die in the presence of unlimited quantities of it.

The nutritive matter contained in an acre of wheat straw weighing 3,000lbs. consists of 1,500lbs. of husk or woody fibre, 900lbs. of starch, sugar, &c., 40lbs. of gluten, 60lbs. to 100lbs. oil or fat, and 150lbs. of saline matter. It will be seen from another analysis that straw consists of 13·15 per cent. water, 2·38 per cent. flesh-forming matter, 5·11. per cent of heat and fat giving material, 3·19 mineral matter, and 76·17 per cent. woody fibre. When burned there will be a waste of about 96 per cent., and the analysis of the remaining ashes gives us, according to the three analysts named—

	Berthier.	Boussingault.	Fromberg.
Potash.....	10·86	9·56	15·52
Soda.....	—	0·31	—
Lime.....	5·36	8·83	4·58
Magnesia.....	—	5·19	2·45
Oxide of iron.....	2·32	1·04	1·56
Phosphoric acid.....	1·12	3·22	2·92
Sulphuric acid.....	0·44	1·04	10·59
Chlorine.....	2·82	0·62	1·56
Silica.....	77·08	70·19	60·58
	100·00	100·00	99·76
Percentage of ash.....	4·40	7·00	—

Straw chaffed and ensiled in alternate layers 1ft. deep with green rape or pea haulms, cabbage, or any other succulent green fodder, will make attractive and nourishing food for any kind of live stock.

There is every probability that in many places of the State rape seed sown now on fallowed land will give a fair crop of green feed. Three to four pounds of seed will be sufficient for an acre of drilled, but 8lbs. to 10lbs. will be needed if sown broadcast.

For green feed it is not too late in many places to sow some maize, holcus, sorghum, dhurra, Kaffir corn, or other variety of the family. These autumn crops should always be drilled in and be continuously cultivated.

If feeding stock with beet or mangold leaves, begin with small quantities and gradually increase the ration.

If cattle or horses are turned in to graze upon sorghum, maize, or other green fodder whilst they are very hungry, it is highly probable they will become "blown" (tyimpanitis), and many will die. It is never to be recommended to turn stock on to young sorghum or maize. The plants are best when the seeds begin to become firm. A full crop of seed and a crop of green fodder can thus be secured, and danger of bloat can be avoided.

Malting barley should be reaped when fully ripe, protected carefully against wet, thrashed during fine clear weather, and placed in the barn ready for marketing.

Cape barley for feeding may be stripped, as it does not matter if a little of it is cracked. To prevent some of the cracking cover the blades of the beaters with green hide, and place green hide or bacon rind around the ends of the spindles within the brasses or bushes.

Shearing may be left until the middle of the month if there are no burrs or seeds to be picked up by the fleeces. The presence of any vegetable matter, such as grass seeds, string, chips, &c., greatly reduces the value of the wool; because the dyes used in dyeing the cloth will not take on the vegetable fibre, etc., mixed with it.

In harvesting peas choose damp weather, or do it very early in the morning. If intended only for feeding purposes, place the stacks near to the pig pens or stables and feed the straw without thrashing it. Turn pigs or sheep on to the land where the peas were grown, and they will gather up nearly every seed that dropped out.

Heat, cold, and exposure will cause a waste of flesh, health, and energy in horses, cows, or any other animal. This loss can be partly compensated by extra food, but it can be considerably prevented by provision of shelter. A five-wire fence is not sufficient shelter; a wall or the lee of a stack may be a little better, but a proper shed is best.

Directly an implement or tool is finished with for a time have it cleaned; if necessary repaired, painted, and put away in a safe place, where it cannot be injured by weather or stock, and where stock cannot be injured by its presence.

Keep fowls, but keep them away from the buggy, the implements, and from the mangers and the feeding troughs. Wire netting is a capital thing to protect horses against the annoyance of fowls. Do not place the fowl-houses next to the stables, because the vermin will get amongst the horses and make them miserable and unthrifty.

Onions and potatoes should be harvested during cloudy or cool weather, if possible, and should at once be removed from the field into a shady spot. If left in the sun the bulbs or tubers will be scalded, and will rapidly decay.

Select some of the very finest and best ears or heads from each of the cereal crops, and sow the seeds in a separated plot next season. From the produce select all the largest and most prolific plants for propagation next season, and

in a short time there will be enough to cover a large area with the improved variety. Selection and selection continuously is the only way to maintain the standard of excellence. This applies as equally to cereals as it does to vegetables and fruit or to live stock of all descriptions.

Directly the field is reaped it is desirable that it should be harrowed or scarified, in order that the surface may be loosened to let in every drop of rain that falls, to let in the mellowing influence of the air, and, above all, to cover any seeds that may lie upon the surface, so that they may germinate with the rains and serve first as feed for the stock, and later on be ploughed under to clean the land.

NITROGENOUS AND POTASSIC FERTILISERS.

BY W. L. SUMMERS, INSPECTOR OF FERTILISERS.

Several inquiries have been made lately as to the constituents of the various manures on the market supplying nitrogen and potash.

Nitrogen is supplied principally in nitrate of soda and sulphate of ammonia; bonedust and bone manures also contain varying quantities of nitrogen. Nitrate of soda contains about 16 per cent. of nitrogen, and sulphate of ammonia 20 per cent. At the present prices the nitrogen in the sulphate is the cheaper, costing about 7½d. per pound, as compared with 8½d. in nitrate of soda. The latter is, however, more readily soluble, and will act quicker and with less moisture. On the other hand there is more danger of loss from leaching where there is excessive drainage. Nitrate of soda is not largely used here, the local sulphate of ammonia being generally favored. The nitrate is said by many to have an exhausting effect on the soil, but as the sulphate has to be converted to nitrate in the soil before the plants can use it there can be no difference in the after effect, unless the application of the former produces a larger crop, in which case there would be of course more potash and phosphoric acid taken out of the land. Neither manure should be applied to land that is not otherwise in good heart, and heavy dressings should be avoided. Better results will be obtained from two dressings of 1½cwts. each than from one dressing of 2cwts. The great value of these nitrogenous manures to the market gardeners lies in the fact that properly applied they cause rapid growth.

Bonedust contains from 3 per cent. to 4½ per cent. of nitrogen, according to quality; bone supers. also contain some nitrogen. To growers of potatoes, onions, and garden crops the cheaper fertilisers sold under the name of bone manure are worthy of attention, but care should be taken that they contain a fair percentage of nitrogen. These are more bulky than the mineral fertilisers, only containing from 2·5 per cent to 4·5 per cent. of nitrogen and are consequently more expensive to handle; but as this bulk is mainly animal matter and moisture the land is benefited by its use. Blood and offal from slaughterhouses, though very offensive to handle, is usually rich in nitrogen and is rapid in its action.

Of the fertilisers supplying potash the three principal lines sold here are kainit, muriate (or chloride) of potash, and sulphate of potash.

Kainit is a low-grade potassic fertiliser, containing on an average 24 per cent. of sulphate of potash, equal to 12·5 per cent. to 13 per cent. of pure potash. Muriate or chloride of potash contains 96 per cent. to 98 per cent. of chloride of potash, equal to 60·5 per cent. to 62 per cent. pure potash. Sulphate of potash contains 97 per cent. to 98 per cent. sulphate of potash, equal to 52 per cent. to 53 per cent. of pure potash. These cost, per ton, £4, £13 10s., £14 5s., respectively. The actual cost of the potash works out, in

muriate at 2½d. per pound, in sulphate nearly 3d. per pound, and in kainit at 3½d. per pound. The following average analyses of the three forms will show the constituents of each :—

	Kainit.	Muriate of Potash.	Sulphate of Potash.
	Per cent.	Per cent.	Per cent.
Sulphate of potash	24·0	—	97·2
Chloride of potash	—	96·0	0·3
Sulphate magnesia	14·5	0·2	0·7
Chloride magnesia	12·5	0·2	0·4
Chloride of sodium (common salt)	32·5	2·8	0·2
Sulphate of lime (gypsum) ..	—	—	0·3
Moisture	14·5	0·6	0·7
Insoluble matter	2·0	0·2	0·2

It will be seen from these analyses that kainit contains a large percentage (nearly one-third of its total weight) of common salt, and 14·5 per cent. of moisture. For mangolds, asparagus, and other crops that benefit from the application of salt it is very suitable, but it is the most expensive form of potash to buy; for trees and plants that will not stand much salt kainit should never be used.

The cheapest form of potash is the muriate, and were it not dangerous to some plants it would be more largely used than other forms. The presence of chlorine, however, makes it unsuitable for some crops. Tobacco, sugar-beet, hops, strawberries, and a few others are distinctly injured by the application of the muriate. Many authorities also contend that potatoes are injured by it, but numerous experiments have left this point still a matter of doubt, and muriate is used for potatoes to a considerable extent. The potash in the muriate diffuses in the soil better than the sulphate, and this is an advantage.

Sulphate of potash is, on the whole, considered the best for most crops, but it is not so cheap as muriate. It is practically free from chlorine, is quick in its action, and contains a high percentage of potash.

Professor Storer, in his "Agriculture, in some of its Relations with Chemistry," says that potassic fertilisers may be judiciously and profitably applied to peaty soils, light soils, and most poor sandy soils; but heavy clays, as a rule, will not repay the outlay on such fertilisers. Potash salts should not be applied so as to come directly in contact with the young plants or shoots of potatoes; this is particularly the case with kainit and muriate. With kainit or muriate it is generally recommended to apply it some time before planting, and work it thoroughly into the soil.

"WORMY" APPLES.

There are at least three parties in this State who are interested in the question of what shall be done with respect to fruit infested or attacked by the caterpillars of the codlin moth, and it is most important that the subject should be considered calmly and thoroughly with a view to conservation of the best interest of the whole community. In questions of this sort it is inevitable that some amount of inconvenience and even of hardship must be experienced by some people; and, whilst trying to arrive at the greatest good for the greater number, we must use our best endeavors to lighten and minimise the troubles of the minority. It is not necessary to refer to instances where such action is constantly being followed in the administration of our laws, sanitary and otherwise—isolation of diseased people and of contacts, slaughter of diseased stock,

compulsory dipping, inspection of all premises under Health Boards, and in many other ways. If such laws for protection of the public health or of the public property is justifiable, then Acts, regulations, prohibitions, and the like are also justifiable in the endeavor to protect the interests of a large section of the community and to promote the progress of a vast and promising industry.

The first parties to consider in this connection are those who make the most outcry against any legislation. "Great cry and little wool," might, perhaps, describe the actions of a few of these. They grow a little of everything; and, at the time when it is most important that they should be engaged in spraying, bandaging, and gathering the diseased fruit on their apple and pear trees, they must market their strawberries, cherries, rhubarb, asparagus, and other horticultural produce, which are of infinitely greater value to them than the comparatively few apple and pear trees that they have to leave neglected.

Next, there are the extensive growers of apples to be considered. Some have considerable areas that have not yet come into bearing, and others who have regularly exported considerable quantities of fruit, and still continue to increase their orchards, planting chiefly those varieties which find most favor in the markets abroad. These men depend almost exclusively upon their fruit trees, and as a rule are most assiduous in fighting the common pest. They not only follow the directions and recommendations given under the Act and by the inspector, but they also construct moth-proof fruit stores to prevent any of the pests escaping at the commencement of the season, and they are careful to scald all return empty cases coming from the local market. Many of the little growers store their apples in ramshackle sheds, and the caterpillars lodge by thousands in the crevices, from which the moths escape in spring and infect the neighborhood for a mile or two round.

The third party to the question is the general public. The interests of the whole community have here to be considered. There is a very extensive export trade to be developed. Here we have everything in our favor. Our apples have always taken the highest prices in the European markets. We have great hopes of securing good and profitable markets in some other countries, and the Broken Hill, Queensland, and Westralian markets are by no means to be despised. But the whole of those markets will be closed to us if we are not careful to send them nothing but sound, clean, and choice fruit.

It is generally known that Westralia, New South Wales, and Victoria prohibit the importation of diseased fruit, and that such fruit is subject to close inspection and to forfeiture and destruction if introduced; yet it is unfortunately true that some of our purchasers for export have been imposed upon by growers whom they trusted to pack guaranteed sound clean fruit, but who packed "wormy" fruit with a layer of good apples on top. Something of a similar nature was recently reported by Mr. Burney Young, of the London Produce and Wine Depot.

Of course, such practices will soon ruin our prospects of a profitable market in any place. It is not sufficient that a few suppliers are honest and send nothing but sound, first-class produce. One fly will spoil the apothecary's ointment, and one dirty, careless, or dishonest packer may discredit the whole of our exporters. If such things are done in spite of all restrictions and penalties, what would occur if no restrictions existed?

But the growers—one and all—as well as the local consumers, are interested in preventing the sale of "wormy" fruit. It must be remembered, now, that such fruit cannot be exported. Not one of the outside markets is open for our rubbish, and they all refuse to allow us to dump it on to their shores. Those who have such fruit on hand claim that the public want it—at a low price—and that they have many thousands of bushels of "wormy" fruit in the season.

Now the present season gives promise of more than a full average crop, and of this lot there is a very considerable quantity of varieties that are not suitable for the export markets. Not long since we saw apples of excellent quality sold at prices ranging from 9d. to 2s. per bushel, delivered in the city. The Export Produce Department might, perhaps, prevent such extremely low rates prevailing again; but it would be absurd to expect that anything like good prices would be secured in presence of thousands of bushels of "wormy" fruit on the market. If proper care had been taken it would not be possible to dump such a lot of rubbish amongst the sound fruit; and it would have been clean, sound, and fit for export.

From some tests made it was found that a bushel of "wormy" apples, after being peeled, cored, and cleaned from the exuviae of the caterpillars, gave about 12lbs of so-called "clean" fruit for cooking. The same quantity of sound fruit similarly treated gave about 32lbs. of clean fruit for cooking. To say nothing about the filth and the extra labor in cleaning the "wormy" fruit, what is the real difference in value between sound fruit at 3s. per bushel and the dirty stuff at any price. Is it in any way credible that any poor hard-working person would be eager to buy "wormy" fruit at 1s. per bushel when he could purchase clean sound fruit at 3s. per bushel, or even 5s.? But is it likely that anything like such prices would prevail for any kind of apples or pears whilst the market is flooded with "thousands of bushels" of rubbish that can be offered at extreme glut prices?

It might be fairly asked whether it would not pay much better if those persons who cannot or will not fight codlin moth were to take out their apple and pear trees and occupy the land with something that is not subject to their attack. If they persist in breeding the pest, as they do, they are a curse to their neighbors and a standing obstacle to the progress and welfare of a very great and promising industry. If every grower were to do his duty to himself and to his neighbors there would be very little trouble from "wormy" fruit; but because a few cannot afford the time at a critical period to cope with the pest, all other growers who do attend to it are subject to heavy losses and threatened with ruin.

It might be allowed, for a year or two, that infested apples could be allowed to be removed under very strict supervision to central factories for manufacturing purposes—say "toxa" poison for rabbits, which would be its most suitable use, or verjuice (cider vinegar). This, however, is a matter for very careful consideration.

THE CODLIN MOTH.

COMPILED BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

The flesh-colored caterpillar with a dark-brown head frequently found in our apples and pears is the larva of this moth. It comes from a flat milky-looking egg, about the size of a pin's head, which is deposited upon the fruits and adjacent leaves by the moth.

During the winter, when the fruit trees are bare, the caterpillar generally lies hidden away in a silky cocoon spun beneath the rough bark of the trees, or in knotholes or wounds in the wood. It also hides in posts, stakes, fences, fruit cases, crevices in fruit houses, or any other shelter that was at hand when it left the fruit towards the end of the previous summer. When the spring arrives the caterpillar gradually changes into a small reddish-brown chrysalis. The moth develops inside of this chrysalis shell immediately.

After the blossoms fall and the young pears and apples are noticeable, the first of these moths burst their chrysalis cases and force a way out through the closely-spun cocoon into the open air.

After pairing, the females deposit eggs upon fruits and leaves of the apple, pear, and quince trees, but seldom on those of stone fruits. In a few days from each fertile egg a small white hair-like black-headed caterpillar emerges. It crawls upon the fruits, and soon settles down to gnaw a passage into the pulp. The first evidence of its presence is shown in the reddish-brown sawdust-like burrowings protruding from the entrance of the tunnel. The infested fruits either fall or assume a ripened appearance prematurely. In about three weeks the caterpillar is full grown, and it then gnaws a passage out and quits the fruit. Sometimes, by means of a silken thread, it lowers itself to a branch below or to the ground. It then crawls for refuge either to the tree stem, or any other available shelter, to spin a cocoon, change to a chrysalis, and emerge as a moth. The eggs deposited by this second generation of moths give rise to the second and most destructively numerous brood of caterpillars we find in the almost full-grown fruits. Knowing thus much of its life history we are better equipped to combat it. Catching the moths by means of lights and baits has proved of no value thus far. The egg, caterpillar, and chrysalis stages, however, offer better opportunities. The following remedies are based upon the life history as outlined above :—

Destroying the Eggs and Young Caterpillars.

Sprayings with kerosene emulsion, applied at fortnightly intervals, beginning immediately after the young fruits are formed, have proved of value in egg destroying. Sprayings with the arsenical mixtures given below have proved of great use in killing newly-hatched caterpillars when applied under the same conditions, *i.e.*, at fortnightly intervals after the apple and pear fruits are formed.

Cleaning the Stems of the Trees.

Between July and October in every year scrape off all dead bark from the trunks and limbs, clean out all knotholes and crevices, and saw off any broken ends of limbs from all pear, apple, and quince trees, and any other kind growing close to them. This work of scraping should be done thoroughly, and should extend from 2in. or 3in. below the soil line up to the latest cracked off bark. Catch and burn the scrapings wherever practicable. This is done to destroy the caterpillars and chrysalides before any escape as moths.

Bandaging the Stems of Trees.

In each year between the beginning of October and the middle of November place a bandage around the stems of all apple, pear, and quince trees, and any other kinds standing near by. A piece of common sacking 8in. wide folded once makes a suitable band. It should encircle the stem completely, and be drawn tightly and secured by a cord or pin.

The caterpillars collect beneath and inside of such bandages, providing all the other shelters enumerated above have been withdrawn. The bands should be removed weekly throughout the fruit season, and all caterpillars crushed. If left undisturbed for two or three weeks during midsummer some will have undergone the necessary transformations and emerged as moths. Remove and cleanse the bandages finally after midwinter.

Collecting Infested and Fallen Fruits.

If the trees are small the infested fruits should be picked off weekly, or as often as possible. All fallen fruits should be collected at similar intervals, and receive immediate treatment, to kill the insects if they are still inside. Boiling, or submerging in cold water for forty-eight hours, or cutting or crushing them up, are common methods of effecting this end.

Taking away all other Refuge.

Keep all vegetable growth, stakes, stones, rubbish, posts, &c., away from the trees *between November and June* in each year.

Fruit Houses and Cases.

Before October in each year all old fruit cases on the premises should be submerged in boiling water for at least five minutes. The fruit stores should be closed, so that moths hatching therein may not escape. Cheese cloth nailed over all apertures will effect this purpose; kill the moths from time to time.

How to Make Kerosene Emulsion.

Kerosene, 2galls.
Common soap, 1lb.
Soft water, 1gall.

Boil the soap in the water until it dissolves. Then add it boiling hot to the kerosene. Transfer it with force from one bucket to another by means of a syringe, until it thickens into a cream-like substance. For general use add 1gall. of this stock solution to 12galls. of water.

Paris Green and Lime.

1oz. Paris green (Blundell's)
 $\frac{3}{4}$ lb. fresh lime
10galls. water

Slake and strain the lime. Work the Paris green powder into a smooth paste with some of the strong limewater. Then add it to the remainder of the 10galls. of limewater. Keep it constantly stirred when applying and only mist the fruits all over lightly; do not drench them.

Arsenite of Soda.

1lb. white arsenic
2lbs. washing soda
1gall. of water

Boil the soda in the water till it dissolves. Then stir in the arsenic and boil until it dissolves. This usually takes about an hour. When about to spray add 1pt. of this mixture to 40galls. of limewater, made by slaking and straining 4lbs. fresh lime. CARE SHOULD BE TAKEN IN MAKING, KEEPING, HANDLING, OR APPLYING THE PARIS GREEN AND ARSENITE OF SODA MIXTURES, AS THEY ARE EXTREMELY POISONOUS.

THE "CURL LEAF" OF THE PEACH AND ITS TREATMENT.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

Mr. G. S. Wright, of Unley Park, who is well known as an enthusiastic and successful amateur peachgrower, has kindly forwarded the following information to me. He writes as follows:— "I enclose you a list of my peach trees, the dates on which the fruits ripen, and I have indicated those which are very badly affected by the curl leaf (*Exoascus deformans*), those only slightly affected, and those which practically resist the fungus. Last year (1900), during September and October, the disease was very severe with me, and the trees marked 'Very badly affected' were a mass of disease, and I paid from 3s. to 4s. each to have the affected leaves picked. This year I thoroughly sprayed them with Bordeaux mixture, and so far I have been unable to find a single diseased leaf upon them. Those marked 'Slightly affected' and 'Resistant' I did not spray, and as a result

those marked 'Slightly affected' have a few diseased leaves, but those marked 'Resistant' are still free, as was the case last year. Sixteen nectarine trees were badly affected last year, and these I sprayed when spraying the peaches, and I am pleased to say with the same result. I sprayed just when the color was showing well and the buds about to open. I used 6lbs. bluestone, 6lbs. fresh lime, to 40galls. of water."

Variety.	Degree of susceptibility to Curl-leaf Fungus.	Period of Ripening on the Plains.
1. Amsden's June	Resistant	From about December 6 to 10
2. Early Alexander	Slightly affected	
3. Early Canada (High's)	" "	
4. Wonderful	Resistant	About December 18
5. Brigg's Red May	Slightly affected	
6. Downing	" "	
7. Matia	Resistant	" " 25
8. Wiggins	" "	
9. Early Rivers	Slightly affected	
10. Hale's Early	" "	" January 5
11. Mountain Rose	Badly affected	" " 10
12. Early Crawford	Resistant	" " 18
13. Early Silver	Badly affected	" " 20
14. Royal George	" "	
15. Noblesse	" "	
16. Magdalene	Slightly " "	" " 25
17. Foster	Resistant	
18. Merchant Campbell	Badly affected	
19. Schumacher	Slightly " "	" " 30
20. Merri Merri	" "	
21. Chinese Cling	Very badly affected	
22. Elberta	" " "	" February 2
23. Wheatland	Slightly affected	" " 3
24. Muir	Resistant	
25. Globe	" "	
26. Sea Eagle	Very badly affected	" " 12
27. Nichol's Orange Cling	Resistant	
28. Old Mixon's Tree	Very badly affected	
29. Susquehana	Resistant	" " 18
30. Late Red	Very badly affected	" " 20
31. Lady Palmerston	Slightly " "	" March 6
32. Garland	Resistant	
33. Silver Medal	Slightly affected	
34. Comet	Resistant	" " 22
35. La Grange	" "	
36. Laughton (local), known as Clifford's Late	" "	
37. Salwey	" "	" " 30
38. Steven's Rare Ripe	" "	" " 20
39. Late Red Italian Cling	" "	—
40. Bonanza	" "	—
41. Late October	" "	April

PHOSPHORUS POISONING.—In cases of poisoning from phosphorus, corollin, prussic acid, atropine, aconitine, nicotine, curarine, strychnine, and morphine, doses of 5grs. to 10grs. each of permanganate of potash and sulphate of aluminum should be given to an adult sheep or pig, 15grs. to 20grs. of each to horses, and 30grs. to 50grs. of each to cattle, and proportionately lesser doses for smaller animals. It is most important to remember that the stuff *must be perfectly dissolved* in pure soft water. The two materials should be finely pulverised, and then stirred in the water for two or three minutes; let the solution stand for three minutes, gently pour off the liquor, and if there is any sediment left put in more water and dissolve it.

ORCHARD NOTES FOR NOVEMBER.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

Cultivation.

The occurrence of good showers at almost regular intervals necessitates frequent attention to stirring the surface of the soil. It is true, in actual practice, the orchardist is not able to scarify after every rain. The nearer his means will permit him to keep the surface in a finely-divided condition, however, the better it must prove in the long run for the well-being of his trees. No two seasons are alike; consequently this work should be regulated by the varying seasons. Last year we were not favored with spring rains, and much difficulty was experienced in reducing the cloddy ploughed surface to a state of fine tilth. The present season has afforded abundant opportunities for carrying out this work. It is generally conceded that the implement best suited to summer cultivation is one which pulverises the soil, but neither turns it completely over nor leaves it in a ridged condition. In the case of newly broken up land it may be necessary to run a roller over to break up clods. In such cases the cultivator should follow immediately in the wake of the clod-crushing implement. If this is not done the flattened surface will prove a greater drawback than the lumpy condition previously prevailing.

Transplanting Citrus Trees.

There is considerable risk attached to this work if the young trees are to be carried over long distances. In such cases intending planters will be well advised in delaying the operation until the coming autumn or spring of next year.

When the young stocks are raised upon the premises, however, the lifting may be carried out with perfect safety. An unbroken ball of earth, enclosing as much of the root system as possible, should be raised and carried with each tree. The young sappy growths should be cut away, and the remainder of the top curtailed in accordance with the number of roots secured to the tree in a sound condition. If the soil at the selected spot is dry, it should be watered a day or two prior to placing the tree in position. Immediately after the planting is completed a good watering should be given. As soon as the surface is dry enough to work without sticking to the tools it should be forked up and pulverised.

Thinning-off Fruits.

In late districts the thinning-off of crowded fruits of peach and apricot should be undertaken early in the month. The accounts to hand do not indicate much need for thinning apricots, as the crop promises to be somewhat meagre. If fine samples are required for canning purposes, this work should not be neglected even now, as densely clustered fruits will not arrive at such a high standard. It is the finest sample of peach that pays; consequently every aid to this end should be utilised. Limiting the number of the fruits is a very important factor indeed in attaining this end. The general health of the tree and the strength of the shoot carrying the fruits are the main considerations in the work. Under any circumstances, the ultimate size to which any variety may attain must be kept in mind, so as to permit proper expansion of the individual fruits.

Green Pruning.

This practice is brought to bear upon young trees to regulate their growths. The strong leader should have its sappy point pinched out to check it temporarily. The weak or disadvantageously placed shoot should be protected to

enable it to benefit by the stopping of its stronger competitors. By carefully following this practice the main shoots may be pretty well balanced at no great detriment to the tree generally. Shoots not required as leaders should be treated from time to time to this point-pinching-out process. This will preserve them to the tree, and, while assisting in the elaboration of sap, they will also shade the stem or lay the foundation of future spurs to carry fruits. There is no doubt as time progresses this much more rational and scientific method of regulating the growth of the tree will supersede to a very great degree the violent amputations of present day practices, as illustrated in winter pruning. If it has not already been attended to, the reduction of barren wood upon mature peach and nectarine trees may yet be carried out successfully. Shoots left at the winter pruning to carry fruits, but upon which none are borne, should be reduced back to the young growths near their bases. By this means the undue extension of the fruiting wood away from the parent branches may be avoided to a great extent. In other cases fruits are borne near the bases only of such winter-left shoots. The upper barren portion should be removed down to the topmost fruit, providing it is accompanied by a young growth. If such a growth is not present the first one above the topmost fruit must be preserved, so that sap will be drawn up past the fruit. At the winter pruning many shoots were cut back to or near the base buds, with a view of forcing out replacing growths to carry fruits next season. On vigorous trees a surplus number of these buds will have started, and those not required should be disbudded. The term "disbudding" is here used to indicate the absolute rubbing away or suppression of the young sappy shoot.

Budding Citrus Trees.

These may be operated upon whenever the stocks and buds are available. The sap should be freely flowing in the stock plant, and the buds should be taken from rounded shoots. Avoid as far as possible the bud accompanied by a thorn. A little sappy wood left in the shield will not affect the union, but fibrous tissue should be avoided, as it restricts the area of cambium contact. Under favorable conditions a good matured growth may be secured this season from buds inserted now. On ordinary deciduous trees better results are obtained when the buds are put in in autumn and allowed to remain dormant over the winter.

Attention to Grafts.

The ultimate success of a graft depends as much on the after treatment of the stock and scion as the care and skill exercised at the time of inserting it. It is a commonly-accepted idea that all shoots arising from the stock should be suppressed. This stands the test of practice where the stock is very small and the growths from the scion soon balance the root system. Where large vigorous trees have been cut off and grafted the vast active root system feels the suspension of the top operations severely. It makes an effort to recover the balance by forcing growth out of many dormant buds on the lower portion of the stem. If these are suppressed it will be further enfeebled, or may at once send up hosts of suckers. It is true the growths from the scions should receive most consideration, but is it wise to entirely suppress all others? The writer has observed the effect of subduing all such shoots by pinching out the growing points from time to time, applied to a grove of regrafted pear trees, and does not hesitate to recommend the practice. Sometimes the shoots from scions or renovated trees not grafted grow out of proportion to the formation of fibrous tissue in them. If not closely attended a series of pendulous shapeless branches is developed. Such thick sappy shoots should have their growing points nipped out from time to time. This checks their extension and induces the formation of stiffening fibre. The waxed bands may soon require attention, but rarely at this early stage.

Fungus Diseases.

The showery weather which has characterised this spring has produced conditions highly favorable to the development of fungus diseases. The shothole is prevalent upon the foliage of all kinds of stone fruits. The curl-leaf fungus has been pretty general upon the foliage of the peach trees, and in the moist hilly districts complaints of the ravages of the fusicladiums upon the apple and pear trees are rife. The use of the summer strength of the Bordeaux mixture will be called into requisition now. We must remember that the local market alone is open to "scabby" fruits. This is quite incapable of absorbing our crops, and in consequence a determined effort must be made to mitigate these diseases. In using copper sulphate when the leaves are expanded, care must be exercised. Plenty of good fresh lime should be used to prevent any burning of the foliage or rusting of the fruits. The volume of water used in the winter, or dormant season, in standard mixtures should at least be doubled. I am unable to see any advantage in treating the peach and nectarine trees after the leaves are "curled," but the spread of the apple and apricot diseases are certainly curtailed by these later treatments.

Insect Pests.

Aphides have been particularly abundant upon most fruits during this spring. Of all of these the black species attacking the peach and other stone fruit trees is the most difficult to suppress. Many liquid spraying remedies are advanced, but the writer, after careful testing, pronounces absolutely in favor of the tobacco and soap compounds. This combination can be much more cheaply made than is usually known. The writer finds that if one stick weighing 1oz. of strong black twist be shredded and boiled with 3ozs. of common soap in 1gall. of water for one hour, and then diluted with fresh water to make 4galls. of spray, this destructive pest can be killed absolutely. This costs a fraction over 1d. per gallon, and is cheaper than any other compound which will effect equal results. Some persons affirm that besides killing the pests these washes destroy the small wasp parasites which aids in suppressing aphides. Wherever it strikes the delicate wasp it will do so, but the writer has proved that the wasps emerge safely from the dead bodies of visibly parasited aphides that have been sprayed with the above compound. The experiment proves the above fear to be more imaginary than real.

It is pleasing to note the number of intelligent orchardists who are this year renewing their spraying operations for the destruction of codlin moth. There are many obstacles in the way of carrying out these sprayings regularly and economically, but the future is full of hope to determined men. In my notes for October, by a slip of the pen, I advised the use of 1lb. of *Paris green* to 10galls. of lime water. It should have been 1oz. I trust the mistake has not been the cause of any damage to fruit trees. Great care should now be exercised in applying bandages. The common sacking cut into strips 8in. wide and doubled over once makes a good band. Thinly-woven materials are not so attractive to the caterpillars. Under the bands around Jargonelle pears and other early kinds the first larvæ quitting this season's fruit are usually captured about the middle of November on the plains. In the cooler and later districts they will probably be a month later.

Those who have closed their fruit-rooms to prevent the escape of moths will now begin to see the effects of such an action in the shape of a goodly crop of moths. Needless to say these should be killed from time to time. From this period on throughout the fruit season the soil beneath the trees should be kept clear of all rubbish, and a smooth loose condition be maintained. Last year the caterpillars in large numbers attached themselves to the tree stems just beneath the surface of the ground. This habit suggests its own remedy.

NOTES ON VEGETABLE-GROWING FOR NOVEMBER.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

The frequent changes in the weather, though beneficial to late vegetables of the winter-grown sorts, has been anything but favorable to the warmth-loving summer kinds. There appears to have been ill-success experienced with the melon family, and resowing is the order of the day. These rejoice in abundance of well-decayed manure, but it should be thoroughly decomposed. Any plants still in pots should be set out as soon as possible. If they are retained in the pots and become stunted, aphides will play havoc with them. A cool change or evening time is best suited to setting them out.

Successional sowings of dwarf or runner beans should be made. The soil should be in good moist condition before sowing the seeds in it. The difficulty of obtaining a good stand of plants is usually great. Loose broken manure or compost, through which the brittle germinating stems may penetrate to the light, is desirable as a covering. It is a good plan to mix a little superphosphate with this prior to spreading it out. Treated as described above, seeds which have been soaked in fairly hot water usually come through before any further watering is necessary. This is very desirable, for as soon as the top soil has been splashed with water it cakes more or less, to the detriment of the progress of the beans.

Tomato plants should not be forced with water to any great extent until some fruits are definitely set upon them. If an opposite course is pursued they will bloom freely, but shed the flowers just as rapidly.

Sowings of silver and red beets and New Zealand spinach may yet be made upon the plains where water is available.

In cool shaded places radishes, cresses, and lettuces will be sown, but the latter should not be transplanted now.

The harvesting of early onions and potatoes will be in progress.

Mulching the surface of the beds with broken manure and constant applications of water are essential in the proper growing of most vegetables on the plains at this time of the year. Next to these repeated stirrings of the surface with the fork or hoe yield the best results in the way of preserving moisture and stimulating growth.

Asparagus beds should be well attended now, and, if not already applied, a good dressing of manure such as superphosphate applied.

Useless kinds of vegetables should not be permitted to run to seed at random. The sowing of seeds from tested plants is always desirable. The commercial grower never relies absolutely on bought seeds. If this has been proved best for him it will prove most valuable for the small grower.

In the cool deep gullies of the hills the gardeners are now busy with the sowing and planting of crops to supply the people with succulent vegetables which will not thrive on the hot open country. Alongside these winter vegetables are grown most of the summer vegetables of the plains, thus affording a range of variety unsurpassed in any climate.

SAND IN HORSES.—Give a winebottleful of yeast, then throw the horse on its back, roll it from side to side, and rub the belly in order to shake up the sand. Then inject, per rectum, a few gallons of warm water (comfortable to the hand); let the horse rise, and most of the sand will be voided. Give feed of pollard damped with warm water. (2) Or give a hot bran mash on an empty stomach, followed by good feed of pollard and water, mixed to the consistency of gruel.

PRODUCE EXPORT DEPARTMENT.

BY THE MANAGER.

Lambs.

The absence of early rain and the consequent shortness of feed has affected the export of lambs this season to a serious extent. Up to the present the department has treated some 10,795 lambs, and supplies are now steadily coming forward. A fair proportion of those treated are being shipped for sale through the London Depot on the owner's behalf. For the lambs sold by the department last season an average net return of 8s. 11d. each was obtained, to which the value of the skins and fat must be added. Persons desirous of shipping in this way need only communicate with the Manager, when full particulars will be supplied as to when the lambs can be received for treatment and shipped. Every care is taken to avoid delay in settlements, and the results of the sales will be cabled as soon as sales are effected in London, when shippers may obtain, as nearly as possible, payment in full for their shipment. Advances of 1½d. per pound (at 5 per cent.) and the freight charges will be made on lambs of approved quality.

Butter.

The quantity of butter coming forward for export this season is small, and up to the present there has only been 34 tons 4cwts. of butter shipped, which, according to the London reports, should fetch high prices, as at present there is a very strong market.

Wine.

Shipments have shown a marked increase during the present year, and should they continue the London manager will have a sufficient stock to cope with the increased sales he confidently anticipates. Each year has shown a steady increase, and for the last twelve months his sales reached 110,000galls.

INGENIOUS SURFACE TANKS.

The special correspondent of the *Western Mail* (Perth, W.A.) supplies his editor with the following:—

Not only have these energetic settlers shown what might be done by means of surface tanks; they have also provided an object lesson of great value in showing how to cheaply catch surface water from rocks and iron roofs. The old way—and I might say the universal way—is to make underground tanks water retentive by means of cemented brickwork. This process is costly and often unsatisfactory, as many can testify who have seen their summer supply of water gradually disappearing through some crevice in the bricklayer's work. In South Australia they have a much better idea than this, and one has only to see it in force—as it can be seen at Katanning—to realise how valuable it is. The material of which the sides of the tank are constructed is flat galvanized iron, eighteen 10-ft. lengths. A hole about 3ft. deep is sunk in the ground, of the diameter to which it is intended to erect the tank. The flat sheets of iron are placed upright, having their bottoms resting on the floor of the excavation. The sheets are overlapped about 2in., and a piece of webbing, or even old bagging, saturated in tar, inserted in the lap. This joint has an iron rod running on the outside for the full length of the iron, and a length of angle iron similarly placed on the inside. The two bars are connected through the joint by means of bolts placed closely together. These are screwed up until the tar is squeezed out and over the adjacent iron. The top of the tank is strengthened by an iron bar about a foot down, bolted round the periphery to the standards forming the joint. Such tanks can be put together or entirely removed and re-erected in a day. That they conserve water perfectly I had ample opportunity of observing. One is erected under the lee of a granite rock. A rough watercourse is worked along the base of the rock, and a discharge provided into the tank. The result is that an inch of rain, or perhaps less, means the catching of 20,000galls. to 30,000galls. of pure rain water. When all but the last sheet is in position, a mob of sheep is run on to the floor of the tank, in order to puddle. Then the sheet is screwed up, and the tank is finished. In South Australia they have built such tanks to hold 60,000galls. They are well worthy the inspection of the Water Supply Department.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of October, 1901:—

Adelaide	1.55	Manoora	2.60	Macolesfield	3.66
Hawker	1.59	Hoyleton	2.08	Meadows	4.90
Craddock	1.89	Balaklava	2.04	Strathalbyn	1.94
Wilson	1.63	Port Wakefield	1.72	Callington	1.39
Gordon	1.21	Saddleworth	2.40	Langhorne's Bridge..	1.11
Quorn	2.02	Marrabel	2.56	Milang	1.04
Port Augusta	1.03	Riverton	3.08	Walleroo	2.10
Port Germein	1.52	Tarlee	2.86	Kadina	2.25
Port Pirie	1.91	Stockport	2.68	Moonta	2.47
Crystal Brook	3.00	Hamley Bridge	2.02	Green's Plains	3.21
Port Broughton	2.47	Kapunda	2.63	Maitland	2.94
Bute	2.29	Freeling	2.17	Ardrossan	1.84
Hammond	1.36	Stockwell	2.57	Port Victoria	1.84
Bruce	2.54	Nuriootpa	2.50	Curramulka	2.50
Wilmington	2.36	Angaston	2.57	Minlaton	2.35
Melrose	2.66	Tanunda	2.86	Stansbury	2.10
Booleroo Centre	1.49	Lyndoch	3.32	Warooka	1.59
Wirrabara	2.10	Mallala	1.90	Yorketown	1.31
Appila	1.82	Roseworthy	1.73	Edithburgh	1.45
Laura	2.63	Gawler	2.46	Fowler's Bay	0.92
Caltowie	3.09	Smithfield	1.77	Streaky Bay	1.10
Jamestown	3.28	Two Wells	1.74	Port Elliot	1.35
Gladstone	3.32	Virginia	1.71	Port Lincoln	2.03
Georgetown	3.90	Salisbury	1.92	Cowell	0.85
Narridy	2.40	Teatree Gully	2.97	Queenscliffe	0.96
Redhill	3.19	Magill	2.27	Port Elliot	1.50
Koolunga	2.18	Mitcham	3.20	Goolwa	1.62
Carrieton	1.65	Crafers	4.46	Meningie	1.15
Eurelia	1.43	Clarendon	4.01	Kingston	1.40
Johnburgh	1.30	Morphett Vale	1.43	Robe	1.44
Orroroo	1.50	Noarlunga	1.18	Beachport	1.58
Black Rock	1.76	Willunga	1.43	Coonalpyn	1.59
Petersburg	2.05	Aldinga	1.36	Bordertown	2.53
Yongala	2.56	Normanville	2.02	Wolsley	2.40
Terowie	2.64	Yankalilla	2.23	Frances	2.53
Yarowie	2.20	Eudunda	1.94	Naracoorte	2.24
Hallett	2.37	Turoo	2.77	Lucindale	2.05
Mount Bryan	1.85	Mount Pleasant	3.20	Penola	2.47
Burra	2.41	Blumberg	3.90	Millicent	1.72
Snowtown	2.63	Gumeracha	4.32	Mount Gambier	2.74
Brinkworth	2.48	Lobethal	4.12	Wellington	1.85
Blyth	1.82	Woodside	3.18	Murray Bridge	0.92
Clare	3.26	Hahndorf	4.19	Mannum	0.57
Mintaro Central	3.04	Nairne	3.24	Morgan	0.94
Watervale	3.70	Mount Barker	3.56	Overland Corner	1.03
Auburn	2.94	Echunga	3.28	Renmark	2.08

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Company report:—

November 1, 1901.

Though there is very strongly emphasised at all times, in some parts at least of this country, the uncertainty of our climate, reminding us of the proverbial danger of the many slips 'twixt cups and lips, so that it is never safe to prophesy as to what the coming harvest is likely to be, still, the weather experienced during the past month gives us courage to at least predict an average yield, unless climatic conditions prove utterly unfavorable from this on. A couple of nice useful rains fell during October, about ten days apart, over the agricultural districts, and the month showed a more than usual proportion of cool, cloudy weather, securing for the wheat plant almost ideal conditions for growth and development; many bright harvest prospects in the past have been marred at this season of the year by too much sunshine. Of

course, the season is a late one, and to ensure a high average yield a comparatively cool November will be essential, but as we have passed through many of the usual weather risks, it is to be hoped in our next that we will be able to report good yields being reaped, as in the earlier districts, at any rate, by that time farmers will be harvesting their grain, haymaking already having commenced. In pastoral districts the outlook continues favorable, and, with the improved market for wool, properties that were abandoned several years ago continue to be taken up and preparations made for their restocking.

Commerce continues sound, but quiet, the uncertainty as to the final settlement of the tariff question causing some dislocation. Country trade is fair, but the lateness of the season is affecting city business in some directions. Steady developing work is being done in many of the new gold and copper mining shows at Tareocola and elsewhere, and the successful flotation of a strong local company for the purpose of reopening the old Burra Burra Copper Mine, to test the value at lower depths than hitherto worked, of the very encouraging samples secured by recent diamond drill operations, renders it at least probable that this historical mine, which yielded millions of pounds sterling worth of ore under less favorable working conditions than those of to-day existing in mining, may again become a wealth-earner to the benefit of workers and producers.

There has been a fair demand during the month for wheat, both by millers and shippers. Several charters have been made to United Kingdom and South Africa, all being seemingly anxious to clear up the old crop out of the way before the advent of the new. European markets have ruled fairly steady; a small cargo per *Anglo Norman* of Victorian wheat brought 29s. c.i.f., United Kingdom, but 28s. 9d. is the best price now obtainable. Offers for our crop, December-January shipment, have been received, but the price is low, 28s. to 28s. 3d. being buyers' ideas. Freight has a downward tendency; 27s. 6d. has been paid for new crop early loading, but 25s. to 26s. 3d. is now charterers' ideas. The late bountiful rains have had such a good effect on the growing crops that some leading authorities reckon the harvest of 1901 as likely to equal the previous year's both in quantity and quality. Red rust is reported to have appeared on some West Coast and Franklin Harbor lands, but there is no indication of its becoming general. Flour is being exported at about the usual rate; two vessels are loading at Port Adelaide for South Africa. Western Australia also still continues to draw portion of her supplies from us, but so far Queensland has not come into this market, though, considering the higher rates ruling in Sydney, business should be possible. The plenteousness of growing feed limits trade in forage lines, very little hay or chaff moving, except small local trade and an order for 1,000 tons of oaten to be filled for the War Office. Miller's offal suffered a drop in price when inter-State duties were removed, and feeding grains are dull, although nominally higher in sympathy with values ruling in Melbourne.

Local potatoes should now be at least supplying our market, but we are experiencing the results of the heavy frosts at fall of last season, which has caused the almost total failure of early crops, so that most of our requirements are still being imported, and prices, since the inauguration of inter-State freetrade, rule at about freight and landing charges above Melbourne rates. The high values of onions checked importations, and new locals are chiefly supplying requirements, though, even if plentiful, they are altogether too green for exportation.

Favorable weather during the past month has improved the outlook of dairying matters, and a continuance of present climatic conditions must certainly extend the butter-producing season, and give a larger exportable surplus than a month ago appeared probable. Week by week heavier catalogues have been submitted to buyers, but brisk local demand and for export kept values steady. At least one small advantage from federation has been secured to South Australia in the widening of its market for disposal of eggs (which have always in this State been one of the most important of the minor rural productions), and in the opening up of trade with Melbourne, which has been for years closed to us. This and other inter-State demand showed immediately on the establishing of free trade, and caused values to at once firm up, so that prices are good for this time of year when production is heaviest. The effect of the tariff on cheese, the duty of which was lowered a penny per pound, caused values to ease down to that extent, but this was inevitable, even had no reduction in duty taken place, local makers always being anxious to dispose of as much of their new make as possible so soon as it can with safety be moved to market. Good demand continues for bacon, and no disturbance in this line occurred through the opening of our market to Victorian and other bacon curers, though the relative dearthness of the raw material here and in neighboring markets renders it certain that either live pigs must cheapen or the price of bacon advance, as curers are now working at a loss. Steady business in honey has been done. Beeswax in fair supply. Almonds continue scarce.

Calf and pig raisers, in spite of the lateness of the season, have continued to send carcasses forward to each Friday's market, and, as the weather has generally been cool, with fair results; but the difficulty and risk of placing before buyers in nice bright condition now practically closes business for the summer season. Strong markets for poultry throughout the month gave very satisfactory prices to consignors, turkeys at last advancing in value more commensurate with rates ruling in other poultry.

MARKET QUOTATIONS OF THE DAY.

Wheat.—Port Adelaide shipping parcels, 2s. 9½d. to 2s. 10d.; farmers' lots, 2s. 9d. to 2s. 9½d. per bushel of 60lbs.

Flour.—City brands, £6 10s. to £6 15s.; country, £6 to £6 5s. per ton of 2,000lbs.

Bran and Pollard.—8½d. to 9d. per bushel of 20lbs.

Oats.—Local Algerian and dun, 2s. 3d. to 2s. 6d.; prime stout feeding white, 2s. 9d. to 3s. per bushel of 40lbs.

Barley.—Malting, 3s. 3d. to 3s. 6d.; Cape, nominal at 2s. 6d. per bushel of 50lbs.

Chaff.—£3 5s. to £3 10s. per ton of 2,240lbs., bags in, dumped, f.o.b., Port Adelaide.

Potatoes.—Tasmanians, £7 16s. to £8; New Zealand, £7 7s. 6d. to £7 15s.; New locals, £13 to £14 per 2,240lbs.

Onions.—£10 to £11 per 2,240lbs.

Butter.—Creamery and factory prints, 9½d. to 10½d.; private separator and best dairy, 8d. to 9½d.; good store and collectors', 8d. to 7½d. to 7½d.

Cheese.—South Australian factory, 6½d. to 8d.; New Zealand, 8½d. per pound.

Bacon.—Factory-cured sides, 7½d.; farm lots, 6d. to 7d. per pound.

Hams.—South Australian factory, 8½d. to 9d. per pound.

Eggs.—Loose, 7d.; in casks, f.o.b., 8½d. per dozen.

Lard.—In bladders, 6d.; tins, 5½d. per pound.

Honey.—¾d. for best extracted, in 60lb. tins; beeswax, 1s. 1d. per pound.

Almonds.—Soft shells, 6½d.; kernels, 1s. 2½d. per pound.

Live Poultry.—Medium to fair hens and light cockerels, 1s. 8d. to 2s. each; prime heavy weight table roosters, from 2s. 3d. to 2s. 8d. each; ducks, 1s. 9d. to 2s. 4d.; geese, 3s. 6d. to 4s. 6d.; pigeons, 6½d.; turkeys from 7d. to 9d. per pound live weight for ordinary to good table birds.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, flour, and forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese.

WEATHER AND CROP REPORTS.

APPILA-YARROWIE (October 26).—Recent rains will bring the wheat well out in ear. The crop promises to be a good average one. Haymaking will soon commence, and good returns are expected.

BAKARA (October 25).—Over ¼in. of rain fell about the middle of the month. The average yield will be fair, although not quite as high as last year. Stock are in good condition.

BALAKLAVA (October 22).—The weather has been favorable to crops, which are coming on well now. There have been some complaints of red rust, but it is yet too early to estimate what damage will be done. Haymaking has commenced, and will soon be in full swing. Crops will be later than last year. Feed is plentiful, and stock are in good condition. Shearing is nearly finished, and the clip has been good. Fruit crops will be light; apricot trees have scarcely bloomed at all this season.

CALTOWIE (October 24).—The weather has been all that could be desired during the last fortnight; splendid rain fell in the middle of the month. Wheat and feed have made great progress, and a fair harvest is expected. Shearing is almost finished; the clip is generally fairly light. Haymaking will not be general for about three weeks yet; hay will not be as plentiful as last year. Stock are in good condition, and things are looking very well in general.

CARRIBTON (October 23).—The weather prevailing during the month has been very favorable to wheat and grass. The wheat crops are patchy. In some places fair wheat is to be seen, but there are many paddocks where it is very poor. There are good grass patches on the low-lying lands, but in the hills it is thin and short. Stock in general are in good condition. Locusts are plentiful; and there are fears that the late crops will be soft when the grass dies off, and will consequently suffer.

JOHNSBURG (October 24).—Nice mild weather has intervened during the past fortnight, and since the recent rains both crops and feed have made rapid progress. The crops in this district look well and give promise of fair returns. Mild weather is required with some light rains to secure an average harvest. Some of the early varieties are coming into ear, and while the later sorts are more backward they look healthy and are coming on well. In favored localities near the hills the wheat is better and should yield well. Much depends on the weather during the next few weeks. Feed is plentiful, many paddocks being covered with a splendid growth of barley grass; and stock are in splendid condition. Shearing is just about completed, and graziers are satisfied with the clip. Grasshoppers are numerous in patches, but not likely to do much harm.

KAPUNDA (October 27).—Most of the early sown wheat crops which came up early are good, but those that did not start early are patchy, as owing to the absence of rain for two months.

much of the seed malted. The hay crop will be light. The present rain will increase the wheat yield, which will be up to the average, but it is too late for the hay. Mowing has commenced in parts. Grass is not very plentiful, but it is growing fast.

LUCINDALE (October 26).—Another month of good growing weather—occasional showers and nice warm days. Feed and crops coming on rapidly, and every prospect of a good clip. All stock in a forward condition. Rainfall since September 24 to October 26, 1.75 points.

MELROSE (October 25).—Since last report rainfall recorded here amounts to 1.40in., and the weather is now showery and threatening. Feed is plentiful, and the crops in the immediate neighborhood, though rather backward, appear healthy, and promise good returns. The outlook for those on the plains is not so favorable.

NANTAWARRA (October 28).—Shearing is finished; clip is of good quality, but rather light. Haymaking is almost general. Stock of all kinds are looking well. The weather through the month was, on the whole, very suitable for plant growth. Just at present weather is far from being seasonable; constant showers are now falling, which will do wheat good, but will not improve the hay. Rainfall for month to 24th, 0.96in., and for year, 13.20in.

ORROROO (October 21).—The weather has been almost all that could be desired. A few good refreshing showers have fallen during the past fortnight, which have greatly benefited the crops and grass. Fallowing is drawing to a close with many farmers. Locusts are very numerous in places, and a lot of damage will be done by them this season.

PASKEVILLE (October 28).—The weather has been fairly favorable, though very variable. There have been no late frosts this year. The recent rains have been beneficial, and only for the danger of red rust the prospects would be very good. Stock in fair condition, and feed is plentiful. Haymaking has commenced in many places, and the cut is fair.

PINE FOREST (October 28). Nearly 2in. of rain have fallen during the last two days, which is quite an unusual occurrence for this time of year. Total for year is now 12.67in. Haymaking was general, and some who had commenced stacking have to pull down and dry, as the wet has reached the bottom. Much benefit to the later crops is expected by this fall, but the rough wind accompanying it has done a great deal of damage to the portions nearly ready for stripping. Estimated yield per acre of hay for this district is 1 ton, and wheat 8bush. Stripping will be in full swing in three weeks.

PORT PHILLIP (October 25).—Beneficial rains, varying from $\frac{1}{2}$ in. to 1in., fell in the early part of the month, which revived the crops and grass; but the quantity was too small to show any marked effect in the growth of the wheat crops. The fallowed wheat looks well, and promises to fill with favorable weather; but other wheat paddocks look starved and blue from insufficient moisture. The hay crop will be a very light one. Shearing is now about finished; the clip is not a good one, being dirty owing to the duststorms, and is light and tender. The lamb's wool is, however, very good, though rather short. Fruit trees and vines look healthy. Curl leaf, pear mite, shothole, and oidium have all vanished without any special remedies having been applied. Peaches, apricots, pears, and quinces are setting well, but apples very irregularly.

RED HILL (October 26).—Nice rains have fallen during the month, which have greatly benefited the crops. Haymaking will be general in a few days; the cut will be much lighter than usual. Stock generally are in good health and condition; the feed is dying off. There is not nearly as much grass for the summer in the paddocks as last year.

RICHMAN'S CREEK, October 23.—The early part of the month was dry, and the crops were giving off badly, but from $\frac{1}{2}$ in. to 1 $\frac{1}{2}$ in. of rain fell about the middle of the month, and they are now much improved; but the majority of them are very light and short. Hay will be scarce. The matured crops are looking much better than the others. Since the last rains feed has also improved, and is fairly plentiful and stock generally are in good condition.

RIVERTON, October 26.—Nice showers have fallen, and the crops look well; but they will be lighter than usual.

SADDLEWORTH, October 29.—Splendid rains during the past few days. Hay crops on red ground, though shorter than last season, will yet give fair returns. Prospects for wheat are good. Sorghum has been got in on fallow in good order. Shearing just finished; clip clean, light in greased. Stock generally in good condition and feed plentiful.

STANBURY, October 23.—The weather has been all that could be desired, having less hot winds than usual and splendid rains. More rain has fallen in the farming district a few miles west of Stanbury. Crops are mostly looking well, with feed abundant. Haymaking has commenced, and there will be a fair yield.

STRATHALBYN, October 28.—Splendid rains during the last few days; crops looking well, grass plentiful, and stock in good condition.

SWAN REACH (October 17).—Steady rains have recently fallen at a very opportune time when the wheat was coming into ear. Crops, however, will be light. Haymaking will soon commence. Feed has been scarce; stock in fair condition. Rainfall for year, to date, 6.55in., and since sowing about 4.78in.

WILSON (October 31).—Rainfall for month totals 1.53in. The average yield will be light, although a good rain fell on the 26th.

AGRICULTURAL BUREAU CONGRESS.

(Continued from Page 258.)

THURSDAY MORNING SESSION.

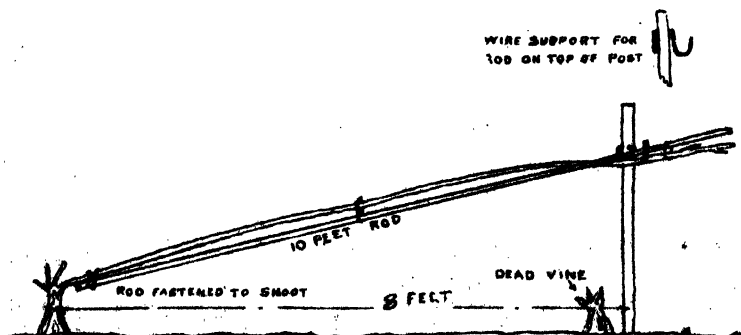
Filling up Vacancies in Vineyards.

Mr. THOS. HARDY, member of Central Bureau, read the following paper:—

This is a subject which may appear of small importance to many persons, vinegrowers included, but I shall be able to show that it is bad management to allow blank spaces in a vineyard.

In the first place, the land has to be all cultivated, whether it is filled or not. The second is the untidy and incomplete appearance of a vineyard with many blanks in it. Many persons think that more grapes are got from the vines adjoining the blank spaces, but a close observation will show that very little more crop is got from them, so that we may safely say that the productiveness of three-fourths of the vacant ground is lost.

Now, having shown that blank spaces in a vineyard are an eyesore and a loss to the owner, I will proceed to show how they may be prevented, and, when they do occur, the best means of filling them. It is well known to all who have raised vineyards that it is of no use to try and fill up the vacant spaces with cuttings or rooted plants after the third or fourth year from planting; even if such plants keep alive (which they seldom do), they never make any growth to speak of, and it is money and time thrown away to attempt to do it. Therefore it is most necessary to see that the vineyard is kept well filled up during the first and second years after planting. Where vacancies do occur from want of this being done, or from other causes, such as the dying out of older vines, the only way to succeed in filling up is by layers from the nearest vines. This was an easy way when vines were planted from 4ft. to 5ft. apart, because rods could often be found long enough to lay down, or the vines sometimes were wholly buried, and shoots brought up where the vine stood, and also in the place where a new plant was required. To such an extent was this done by the Swiss vinegrowers in the Geelong district, that I have known of as many as twenty-five vines that were found all joined together underground when the vines were uprooted in one of the vineyards there some years ago. The difficulty is to get the rod long enough to reach over the wide spaces in our new methods of planting, and after much thought and experimenting I have come to the conclusion that the only reliable way is to prune one of the arms or branches of the vine you intend to get the shoot from to that one only, so as to take all the strength from that part of the vine, then have a stake from 3ft. to 4ft. out of the ground, either of mallee or some wood that will last for three years, and drive it in where you want the new vine to be; then have a light wattle rod about 10ft. long, fasten the large end to the base of the cane you have left, and tie it to the rod at intervals, and cut out all the buds but the two end ones, or rub them off after they have shot out. In the stake near the top bore a small hole, and put a piece of No. 14 wire about a foot long through the stake, bend down one end to keep it from slipping back, and form a hook with the other end to receive the wattle rod.



In most cases it will be found that the rod will have an inclination upward from the vine to the stake, and so much the better if it has, as the new shoots will grow much stronger than if laid on the ground, and be less liable to be injured by the wind. As soon

as the new shoots have grown, say, a foot, they should be tied, and where two have grown, one of them, the best of course, only should be left, and no fruit should be allowed to grow either on the new shoots or on any part of that arm of the vine, the object being to get as much growth as possible in one year. The vineyard should be gone over at least once a fortnight while the vines are growing to tie the young shoots to the rod. If these things are properly attended to it will in many cases be possible to get a rod long enough to lay down in one year, and the rods will not be in the way in cross cultivation of the land, as they can be lifted out of the way for that purpose, and put back again afterwards.

In layering the rods, when long enough they should be bent down at a sharp angle from the vine to a depth of 8 in. or 9 in. below the surface, and brought straight up at the stake, so that the plough or scarifier will not run foul of them in working the vineyard.

If the shoot cannot be got long enough in one year, it should be pruned to the full length and tied securely to the wattle rod, and all buds suppressed, except the two at the extreme end. It is always best to leave two, in case of one being blown or knocked out, and allowed to grow another year, when in almost every case it should be long enough. It is best not to sever the layers from the parent vine for some years, until one is quite sure that it derives its strength from its own roots, and not from the parent vine. Of course, in trellised vines no stakes or rods are required, as shoots are carried along the wire, and they should be carefully tied and not allowed to bear any fruit, as that will greatly prevent the growth of the shoot, and the object should be to get the layer put down as soon as possible, when it will in two years become a bearing vine.

THE CHAIRMAN: Of course there is a great difference in the growth of the different vines, and, consequently, the time for having a rod long enough for such distances varies with different varieties?

MR. HARDY: Yes. As I said, as soon as the new shoots have grown, say a foot, they should be tied, and where two have grown one of them, the best of course, only should be left; and no fruit should be allowed to grow either on the new shoots or any part of that vine, the object being to get as much growth as possible in one year. If these things are properly attended to it will in many cases be possible to get a rod long enough to lay down in one year. Of course in trellised vines no stakes or rods are required, as shoots are carried along the wire.

THE CHAIRMAN: You mentioned in your paper, and I have found it to be so, that for the first or second year you can hardly get any grapes to grow on the vines.

MR. HARDY: I suppose the reason for that is that the ground is so much occupied with the roots of neighboring vines. Many people can scarcely credit how quickly the vines spread in a large space of ground. The roots spread very quickly indeed.

THE GENERAL SECRETARY: One cause of that is the great leafage space occupied by the adjacent vines, and thus the older vines are competing with the weaker ones for the sun and for nitrogen in the air. People do not recognise that the leaves of plants are absorbing carbonaceous matter from the air, and that they are competing with each other. That is not recognised except by gardeners, who say that the plants must have space for light and air. The young and weaker plants in striving for existence are competing with the older plants that are striving for the same things, with the result that the weaker ones naturally suffer. In reference to the rods mentioned by Mr. Hardy the ordinary native pine saplings suit the purpose very well. They are light, strong, and durable, stand well, and the white ant does not attack them.

PROFESSOR PERKINS: I agree with what Mr. Hardy has said, Mr. Chairman, and I consider the theory as stated by Mr. Molineux rather far fetched. There is no question that the roots of the other plants prevent the younger plants from securing the moisture and food in the soil. It is nothing whatever to do with the air, as if the old vines were close enough to rob the young plants of air there would be no blanks to fill up.

MR. HARDY exhibited two instruments which were used for ringing vine. They were good instruments, and could be obtained from Messrs. Harri Scarfe, & Co.

Presentation to the Chairman.

Mr. H. F. L. HOLZGREFE (Millicent): I have a very pleasing duty to perform this morning. It is to present Mr. Krichauff, our worthy Chairman, with an address and a purse of sovereigns—(cheers)—on behalf of ninety-eight Branches of the Bureau. This matter originated with the Millicent Branch some six months ago. It was suggested that the valuable services of Mr. Krichauff to the Bureau were worthy of some recognition. When the Secretary of the Millicent Branch put the matter to the other Branches 90 per cent. were in favor of something of the kind being done, and this morning we are able to carry out what we proposed. In Mr. Krichauff we have a man well worthy of the presentation we are going to make to him to-day. You can look back to his career as an old colonist, for he has been a pioneer, and his history is a splendid one. (Cheers.) During his parliamentary career he was always straight and honest. While in Parliament he took a great interest in and assisted in passing some of our best land laws. His work in the Bureau has been a splendid example. Regardless of fee or reward, he gives his whole time to it for the benefit of the agricultural community, and that was one of our principal reasons for moving in the matter of this presentation. (Cheers.)

The GENERAL SECRETARY: I fully coincide with what Mr. Holzgreffe has said. The Chairman has been active and zealous in his work for the Bureau. He has been too kind to members in allowing them latitude at our Congresses. What Mr. Krichauff has written has been instructive, but finances would not always allow us to print it all.

Mr. HOLZGREFFE handed over the address and purse of sovereigns, and also a framed group photograph of the members of the Millicent Branch.

The CHAIRMAN, who was received with loud cheers, said: Mr. Holzgreffe, Mr. Secretary, and gentlemen—You can well understand my feelings. I was not aware that anything like this would be the result of the action of the Millicent Branch, and until quite lately I was not aware that there was anything of the kind in mind. Of course I admit that I have given my time to an object which lies close to my heart. (Cheers.) As long as I have been a colonist of the State of South Australia I have called myself to the duty of doing what I possibly could for the advancement of the rural population. (Cheers.) When I first of all acted as a politician, in 1857, it was my idea that I was obliged to come forward—at that time I was only a young farmer—to support Sir Robert Torrens in his Bill, more especially as being a German I was aware of the way in which real property was passed from hand to hand in Germany. It was a hard job for a young farmer living twenty-seven miles from town to attend Parliament. I thought it my duty, when asked by the electors of Mount Barker, to stand, and they placed me at the head of the poll. Well, we know that the Real Property Act passed that year, but only by a very small majority on the second reading. There were thirty-six members, and nineteen voted for the second reading, so you can see it was not quite unnecessary that persons should come forward in support of Sir Robert Torrens. After another Bill relating to the distilling of brandy was passed, I thought it was time for me to resign. I could not afford to remain away from the farm so long. There was no payment of members, and it was difficult to get into town. You had to use shanks' pony. A long interval elapsed before I reappeared on the political scene, and then I was requested to come forward for Onkaparinga. One of my chief objects was to bring forward the Forest Bill, and I was singularly fortunate in securing its passing, and of late years we have done much towards building-up forests, but not as much as I would like to see. (Hear, hear.) I claim also—and Mr. Holzgreffe alluded to it—that I have done as much as possible to obtain liberal land legislation, and I believe I was about

the first that mentioned the necessity of opening the scrub lands at a nominal fee. A great many German settlers, after much struggling, have been able to become not merely the cultivators of the land in these scrub lands, but also to some extent have amassed a little money so as to be able to increase their holdings. In all cases I believe I have been on the liberal side for land legislation. I do not recollect any case where I could have acted otherwise than I have done. (Cheers). With regard to my action as Chairman of the Bureau—and I may say as permanent Chairman so far—I have thought that it was necessary for me to instruct myself so far as I possibly could in the new way in which land-cultivation has of late been carried out, and to impart so far as I was able, my knowledge to all of you. (Cheers.) How far I have succeeded I do not know, but if you think I have been successful—and you seem to think so—I am exceedingly thankful, more so for that than of this testimonial, because it is in the hearts of the people that I would like to live. If I can possibly be of service to you for some more years, if God gives me life and sufficient strength for it, I shall do my best to assist the work of the Agricultural Bureau.

The GENERAL SECRETARY briefly explained that every Branch of the Bureau was in sympathy with the testimonial, but the farmers in the Far North had suffered so much that a few of the Bureaus could not afford to contribute towards the cost.

The Export Trade in Fruit.

Mr. GEORGE QUINN, Horticultural Instructor and Inspector of Fruit, delivered an address on "The export trade in fruit." He said: Our export trade in fruit is now an established fact, and is one of the prominent factors of trade. We can divide it into two sections—the oversea export, that is, the export to European markets, and the inter-State export. I have taken a considerable interest in the export to Europe. I might almost call it the export to London, for although last season one or two continental markets were touched, nothing has yet arisen out of the enterprise. Prior to the season 1895-6, when the Produce Depot was established, this trade had been of a very mixed and desultory character. Certain individuals had sent away consignments; one would raise his hopes of a speedy fortune, the next would shatter them. We started trade in 1895 or 1896 on a permanent basis, sending to London 647 cases, and the results were fairly encouraging. Of course we were breaking new ground comparatively. In the next year (1896-7) 11,334 cases were sent away, which you will see was a very great jump. The prices that year were poor. The boats almost uniformly carried consignments in bad condition. All this trade was done through the depot. The growers packed forty-eight different varieties, and the packing was not all that could be desired. The result was that the returns were not great. The next year was a year of scarcity, and only about 4,106 cases were sent to London, but they sold remarkably well. Next year (1898-9) the private buyer and exporter began to see there was money in the business, or rather that there were apples to be procured in South Australia, and they entered into the business, and over 12,000 cases were sent away. Next season (1899-1900) about the same quantity was sent away. Last year, according to the *Register* files, 33,000 cases were sent to London, and, with other shipments made to the Cape and India, the total reached 40,000 cases of apples. You can see our progress has been good. It is steady, and I think you can call it substantial. Since the private buyers came on the scene most of the trade has been monopolised by them. The growers do not appear to have taken advantage of the depot, but have thought it better to sell the fruit direct to the buyers. Whether that is wise or not I am not going to say—that is for each individual to consider for himself; but the present method limits our means of obtaining information as to what is likely to pay us best. I have seen Mr. Young's report on the

Produce Dépôt for the last year, and he sold from there 4,400 cases of apples and a few of other fruits, and I have tried to draw a few points from the returns. I have also interviewed a number of the private exporters, and they have very kindly given me a certain amount of information, which bears out the opinion given by Mr. Young. The majority of the fruits sent were apples, and we will deal with them first. During the last six or seven years we have constantly advised shippers in connection with the export trade, and the returns show that the advice has not been misleading: but still they show we must not rest on what has been done, and that we must alter our conclusions a little. We find that the bulk of the shipment was of the variety Cleopatra, or Pomeroy, or New York Pippin, and I am not sure whether there are not two or three other names given by various growers to this one variety of apple. Half of the quantity sent away by the dépôt and by private buyers consisted of this variety. It is a favorite apple, and succeeds well in some of our districts that are not too wet, but there is a possibility of overdoing this variety. The returns supplied by Mr. Young show that there is a liking for colored apples in the old country. Our old favorite apple, at least one which I very much favor, the Jonathan, has sold well; and several of the private dealers told me they intended to try to get more of these apples, as well as others with a colored skin. I may mention the Rome Beauty as another one which develops its color, and is beginning to take well in the London market. Only small consignments of other kinds were sent, but the prices indicated that these apples, though inferior in flavor to the less colored ones, were likely to take a place in the market. Fletcher's Crimson sold remarkably well, and a local apple, Mac's Red, sold well too. Prince Bismarck also brought a good price on account of its fine color; while the Nickajack sold well for a similar reason. I would not advocate planting many varieties, but we must meet the demand of our customers. The Cleopatra may be superior to all these in flavor, but there is a possibility of overdoing that variety. Not much has been done in pears, and I am pretty confident that we will not establish a trade in pears until packers adopt a suitable package for them. Vicar of Winkfield has sold well. Last year that brought up to 21s., and averaged 16s. For a tree that bears so well as the Vicar of Winkfield, if we get anything like 12s., it will pay wonderfully well. With one exception the pears have been all packed in the large ordinary export case, and pears will not stand the same pressure and treatment as apples. There are a few varieties of good pears that have been carried to England in good condition. I refer to the Glou Morceau, L'Inconnue, Beurre Clairgeau, Josephine de Malines, Vicar of Winkfield, Winter Cole, and Winter Nelis. The last named is a very irregular bearer, and perhaps would not pay to plant in bulk. I have suggested to several growers that they should take the ordinary export case and saw it down the centre. Each half would take two layers of medium-sized fruits, and being packed well they would carry well. When we put them in four or five deep we will make a loss. During last year an experimental shipment was made under the Sutherland process. That process is simply this: The fruit is wrapped in the ordinary way, placed in greased air-proof bags which fit into the cases, the top of the bag is folded over, and a hot iron passed along it so that the oil or wax in the bag will close up and be air-tight. The contention is that this air-tight bag will prevent the condensation of moisture on the fruit. This shipment by the *Warrigal* was carried in good condition, but it struck a bad market. It reached the old country when the market was filled with early fruit from the Continent, and most of the pears were sold at low rates. I saw one man's account sales for the Glou Morceau variety, and he averaged 15s., which is more than he would obtain locally. The great object in packing pears is not to have large fruits. The medium-sized

fruit of any kind will keep better than the large, and in packing pears we should always observe that. Of grapes very few varieties have been sent, and at present I do not think we have much chance of sending others. There are the Daira and the Doradilla, but you cannot get the Doradilla grapes far enough apart. The berries are too thickly clustered. The Daira grapes have paid the exporter better than they would have paid in the local markets, and in the fruit trade as well as in anything else while there is a margin of profit left there is business. In connection with oranges not a great many have been sent away, but we are now growing oranges pretty well in this State, and I am very confident that before half a dozen years have elapsed we shall have to look for oversea markets. Most of the shipments of oranges have been selected, and they were packed in the cool storage. Some people say they will go as general cargo, but when you come to put in hundreds of cases together they will not carry as well as small consignments. In packing for export a lot seem to work on this principle—"We can spare these second grade oranges; we will save our best for the local trade." That was not the way to open up a market, and if our apple-growers had followed that course we would not hold the proud position of sending the best apples and getting the best prices in the English market. Mr. Young says that if good oranges arrive in September, October, and November they will get good prices, and he recommends the Navel orange. Most of you know that the Australian Navel orange is a poor bearer, but the newer orange, the Washington Navel, bears out its characteristic not only of being a prolific fruit, but of being a better orange, and given the proper soil, that is rich flats, we will grow Washington Navels suitable for the English market. I would like to deal with the inter-State trade. We find here we are dealing with a different matter. We have had to be particular over fruits sent to England because of the quality and their ability to stand the journey, but with the inter-State trade we have to consider the freedom of our fruits from diseases. All the other States have laws dealing with certain insect and fungus pests, and these have to be observed in connection with our export trade. Last year we imported somewhere about 45,000 cases of fruits into South Australia. Of course these largely consisted of bananas, and as we cannot grow them here we have not much to complain of. The following figures will give you some idea of our export trade during the same period. We exported to New South Wales alone last year about 74,000 bush. of fruit, and upwards of 15,000 cases or bushels of these were apples, pears, and quinces, which have to be free of disease. We send annually many thousands of cases of grapes to Sydney by rail, and our growers make a profit out of it, so that, with the advent of free trade, our fruit industry is likely to flourish. On the whole I think our climate gives us an advantage, and I believe we will benefit very largely when the border duties are taken away. The inter-State trade has taken quite a new turn during the last few weeks. In the middle of July the Western Australian Government removed the prohibition on our piped fruits, and from then until the end of August we shipped over 6,500 bush. of fruit to Western Australia, and this at the tail end of the season. Of those there were over 4,000 bush. of apples and pears, and over 2,000 bush. of citrus fruits. As I said before, in connection with this inter-State trade, we have to keep our orchards clean, for we have the other States to compete with us. We have to provide the very best fruits. I saw a letter the other day commenting in seathing terms on the South Australian oranges sent to Western Australia in comparison with the Sydney oranges, and the writer was absolutely justified. If our people will send fruit of inferior quality I am not saying diseased fruit—it serves them right if they lose their market. We are also opening up markets with the Cape, Natal, India, Java, Singapore, and other outlying British colonies, and, though the markets are not very large, if supplied in a systematic

manner they will be of very great value to us. There is one little matter I would like to mention. When the West Australian Government decided to admit our fruits they did so on condition that the department here would inspect all consignments, and forward a certificate that the fruit was free from disease. An agitation arose amongst some of the growers about this, and they wrote to the paper about the excessive charges made by the department for examination of fruit. Most people rush to the newspaper because they think civil servants are restrained from telling the truth and cannot reply. We made up a return and found there was very little room for complaint. But representations were made to the West Australian Government, and they recently decided—within the last ten days—to do without the inspection here. When we received the telegram we sent it to the different exporters. A few of them were very jubilant, but others said they would not pack fruit unless an inspector was present. They said the packers did not understand which were diseased fruit, and the result would be they would fall in very heavily over the withdrawal of the inspector. The inspector was a rigid foreman, because he decided what should go in the cases and what should not. The result is that this morning several of the exporters have come to the office and have asked for inspectors. They are willing to pay for them, although the inspection is no longer required. I want to refer again to the export trade to London of this year. The gross returns for apples averaged 12s. 5d per case, and the expenses through the dépôt were 5s. 2d. per case. Allowing a fair margin for cost of case, packing, &c., it would give the grower 5s. 6d. a bushel for his apples, which is more than he would get in the local market. Mr. Young, in commenting on the lower prices this year, states—"The quality of the shipments were in a measure responsible for the lessened returns. The fruit was not so clean as usual. Some lots had been damaged by codlin moth, and a good many were scabby." We have to put up with a lot of humbug from people who object to what we are doing in the way of our duty. They say it would not matter if codlin moth were sent to England, but evidently Mr. Young, who should know more about it, differs from them, as he lays particular stress on this point. Mr. Young also noticed another disease called "bitter pit," especially in the Cleopatra. He goes on—"The disease we call 'brown pitting' was noticed. The packing and grading was fairly good, but the use of two different shaped cases resulted in trouble and caused some to be returned by a buyer." I want to turn to things that are purely our own, that is, to deal with our orchards. With regard to the treatment of our plantations, all the world over we see that only a man who has the cleanest and best fruit gets the market; and it follows, therefore, that we should pay the greatest attention to our orchards. I would like to say I think, as a rule, in our orchards there is a neglect of cultivation, and to a very great extent a neglect of pruning, probably due to pressure of work, and there is gross neglect with regard to diseases in many parts. I fairly claim this, that the man who will continue to neglect in these directions will find he will go to the wall. One of the largest private exporters told me of a certain grower who three or four years ago obtained the highest price for this fruit, but last year he was not given so much; and, judging from what could be seen in the orchard, the buyer thought that in a year or two he would have to refuse to take the fruit altogether. The man thought he had arrived at perfection, and did not clean his orchard or prune his trees, and the result was that he was going to the wall. You may take it for granted it will not pay to send diseased apples to London. In the inter-State trade we are not allowed to send them. Now, as to the time to begin to clean our trees for the next season. The time is just coming when we should spray our apples and pears with Bordeaux mixture, and attend to the codlin moth pest in the districts where it has

obtained a foothold. If we omit to spray our apple trees when they are coming into bloom we may almost as well put away our appliances for the season and put up with "scabby" fruit. There is another question. I think the oversea export has reached a very critical stage. Our apples up to the present, our fruits generally, have returned good prices; but we noticed during the last few seasons that when several shipments arrive during the same week the market was knocked out and the returns comparatively low. If we increase the quantity of our shipments the returns will continue on the down grade. I think we have to ask ourselves why this is so. Why should the sending of 250,000 cases of apples into England during a couple of months swamp the market? It is simply this: that the prices at which our fruits are now sold only permit the wealthy people to buy them, and as far as I can see the only chance we have of increasing our market is to try to obtain lower freights and reduce our cost of production and shipment as much as possible. There will be a meeting to-morrow to deal with this very question. It seems that pretty well all the companies have decided to keep up the present price of 4s. 3d. per case for carriage to London, but one or more lines have decided to charge lower rates. I think all growers and shippers should look around themselves and see which side they are going to stand on. There is another aspect, and it is this: we can see in looking through these shipments that as soon as the private buyer came into the market the shipments increased. The means were there of disposing of your fruits, but you did not take advantage of them. You waited for the man to come to your door and buy your fruit. Whether it pays one to sell at 3s. a bushel in the orchard or take the chances of getting less than 3s. or perhaps double 3s. it is for the orchardist to say himself. I am inclined to think that the whole course of the world's commerce points to that concentration of effort on one line, and I believe the man who will devote his energies entirely to growing fruit will do better than the man who tries to become a merchant as well as a grower. That is the opinion I have formed up to the present. There is another bearing on the subject. If each grower packs his own fruit we will probably have scores of grades in the one market. If a limited number of capitalists buy up the fruit and pack it under their own supervision we will have a limited number of grades.

Mr. T. PRICE, M.P. (Central): Why could we not do it on co-operative lines?

Mr. QUINN: I think if the growers were satisfied to co-operate and pay their own manager and have one or two grades it would be all right. It seems to me the private man is doing the best thing for the fruit trade. In Tasmania the fruit trade appears to be in an unsatisfactory condition. The price is low owing to the fact that the fruit is bought by speculators and packed by the growers. There is a lot of human nature in the grower. He will drop the small apple in when there is no one about. Tasmanian apples are consequently losing their good name. A Tasmanian grower said to me, "Why is it that your fruit is fetching a better price than ours?" When I told him how our trade had been managed he said "I think it is because there is more care taken in the sorting and grading. The present method that obtains in Tasmania is ruining our fruit trade." He was a strong advocate of the law stepping in and fixing grades for apples. That was an opinion of his own. I think that it is a feather in our caps to think that Tasmania, which inaugurated this oversea fruit trade, should send here for particulars as to how we carry on our business. (Cheers.)

Mr. BROWN (Port Elliot): It is a well known fact that apple, as with other trees, bear well only once in two years. I would like to know if anybody has ever found out whether it is possible to grow trees so as to get a certain quantity of apples every year. I think it is an important thing.

Mr. QUINN: Unfortunately there are no means of trying it here, because we have nothing in the shape of an experimental orchard. We have to go to America for the results of experiments. Professor Bailey says it can be done by picking the fruit off one season and attending to the habit of the tree, and altering the period of its productiveness. The quality of the fruit will depend upon the vitality of the tree. I think a safe plan would be to allow half of the trees to bear one year, and so alternate the seasons of bearing with the other half. One season pick off the apples as soon as they are well formed, and so you will find that you arrange the seasons of productiveness. By that means you can have a certain quantity of fruit each year. Professor Bailey is probably the best authority on fruit in the world, having had fifty years of scientific work in that direction.

The GENERAL SECRETARY: This subject was taken up in a British horticultural journal by a writer named Kynaston, who claimed to be able to procure fruit every year from his employer's trees. His theory was to dig a trench half around the trees and cut the long roots, and then put in a considerable quantity of fertilisers and feed the trees well. Next season the other half was treated in the same way. By that means the numerous fibrous roots formed and absorbed the food, which is the principal thing. He was able by that practice to secure fruit every year.

Mr. QUINN: I wish it to be understood that the trees are properly fed even under the treatment I advanced. Of course, under ordinary circumstances the plant food in the ordinary soil alone would be insufficient to build up its vitality.

Mr. PRICE, M.P.: I would like Mr. Quinn to give me some information on a point that has always troubled me in connection with lemons. I am a grower of lemons, but can only get 4s. a case for them. By the latter end of December and during January and February we will be importing lemons, and at the present time we have them in abundance. I ask Mr. Quinn if it is not possible to remedy that, and so conserve our fruit, say, at the Produce Depot, as to be able to put them on the market when they will return 16s. and 17s. a case?

Mr. QUINN: Only in the last week or two I have seen many thousands of bushels of lemons on the trees. At the present time, I think, they are selling at 4s. a case, and, as Mr. Price pointed out, in a few months they will be fetching a high price and there will be something in them. The process of keeping the lemons is a simple one. Of course we must be careful in handling the fruits; they must be picked carefully and all bruising averted. Then pack into boxes and stack in the shade for a few days - in warm weather four or five days is ample. The moisture evaporates to a certain extent, and the skin becomes tough and thin. The fruit is then stored in single layers in a cool store or cellar, and will keep for several months in good condition. The fruit must be cut when of full size and the first signs of yellowing noticed on the skin. If left on the trees until the fruit is ripe it will not keep more than a few weeks. The process is simple and effective.

Mr. GRASBY said: When I was in Sicily the main crop was being gathered, and I was able to see the lemon industry at its best time. Reference has been made to the handling of lemons for storing. In Sicily the fruit is handled with the greatest care, and the closest attention is paid to grading. The magnitude of the trade is due in a large measure to the skill and care in handling; and the Sicilian worker does it quickly. The picking is done by men, women, and children, and they have small wicker baskets to place the lemons in. The fruit is afterwards graded, the defective fruit being sent away at once, and the good fruit is taken to the fruit-house and there spread out on the floor. This is done to allow the moisture to evaporate from the skin. The

sound lemons in the end are wrapped up in tissue paper and carefully packed in boxes for storing or for export. The lemons are stored in dark underground grottoes or cellars, I believe, in addition to the cool stores, and in each case they are inspected frequently. I had some difficulty in being able to witness the operation of packing for shipment, as all sorts of excuses were made to prevent my entry into a packing-house. At length, however, I got the necessary permission, and found the packing-house to be well constructed, clean, and conveniently arranged. When lemons are to be exported they are taken direct from the grottoes or stores to the packing-houses, and the sorters are experts who detect the least defect. The method of operation I described in some articles I wrote in 1898 in the *Register*. It is only necessary for me to say here that the packing is most skilfully performed. I think, from what I saw, that a simple remedy for storing in South Australia would be to place the lemons in a cool chamber and store fruit of the best quality—that is, sound fruit and carefully graded.

Mr. QUINN said: A refrigerating chamber is not necessary. Mr. Williams, of Doncaster, one of the largest growers of lemons in Victoria, treats his lemons in the way I have described, and keeps them for several months in a cool, airy cellar.

THURSDAY EVENING SESSION.

In the absence of Mr. Krichauff, Mr. Thomas Hardy, of the Central Bureau, presided.

Poultry for Farmers.

Mr. D. F. LAURIE, Government Poultry Expert, said: For the last ten or twelve years I have been doing my little to induce people to recognise the value of poultry-keeping, and the greatest bar to the progress of the industry is indifference. My ideas on poultry keeping are not only the result of my own practice. I have visited the other States on various occasions, and have had opportunities of inspecting poultry of all sorts and conditions. I have met the fancier who breeds for show points and the man who breeds on a large scale. I met Mr. Grant, one of the largest apple-growers in Australia, and he told me that if growers only knew the value of poultry in orchards there would never be an orchard without one. He gave me an instance. They use paper bandages round the trees for codlin moth, and the fowls pick through the paper and eat the caterpillars. If we had more poultry on the farms we would have less of plagues. I believe the grasshopper plague is due to the destruction and disappearance of the native birds, and in their place we can put poultry. The man who has an orchard will go in for the egg-laying breeds which do not fly. Farmers say the fowls get out and scratch up acres of wheat and destroy haystacks. That does not show the best of management. It always pays best to protect the haystacks even from fowls. The poultry industry is no mean one in this State. We export about £60,000 worth of eggs annually. This, therefore, is no fad, but a definite branch of industry. Farmers must now look to the minor industries, and I do not know a better one than poultry-keeping.

Mr. Laurie then read the following paper on "Poultry for Farmers":—

The general importance of poultry-keeping, as an adjunct to farming, fruit-growing, and other rural occupations, has not received due recognition in the past. Should the same state of indifference characterise the future, it will not be for lack of available information on the subject placed at the disposal of all who are willing to learn.

A few years ago it was quite the exception to hear anyone but a poultry fancier speak well of the poultry industry; of late, however, a great change has taken place, and on all hands one finds seekers after information.

In the other States matters are farther advanced than here, and in consequence there is a much better supply of table poultry for local markets, and a respectable surplus for export. South Australia is not a great exporter of poultry, although a small trade has existed with West Australia for some years. As an exporter of eggs this State stands easily first, and the argument holds that, if we can produce a large surplus of eggs for export, we can also do the same with table poultry. The yearly value of our exports in eggs is about £60,000, and this could be increased to £600,000 without producing any lowering effect on the prices ruling in the world's markets.

Numerous successful shipments of eggs and frozen poultry to Great Britain, South Africa, and elsewhere indicate to us a most profitable outlet for any surplus we are ever likely to have. Time allowed me does not admit of enlarging on this subject, beyond saying that the experience of exporters in the eastern States is so satisfactory that there is not only a continuance, but a steady increase.

LOCALITY.

There are few parts of the settled portion of the State where poultry will not thrive, and where that is the case the farmer is not to be found—or should not. Certain breeds thrive apace in cooler districts, others give satisfactory returns even in arid parts.

Most country residents own poultry of some sort or other. The majority may, however, be classed as unproductive, as but little profit accrues from the average inbred mongrel hen. For many years it has been my object to induce those who keep poultry to breed a better class, whether for table bird production or for the supply of eggs. It is never intended that all should try their hands at exhibition poultry breeding, but it is in this direction that I notice occasionally bad signs. Everyone who purchases a sitting of eggs, or a few pure-bred birds, wants to start straight away breeding birds for show. Their time would be better occupied in improving the general run of their own flocks, replacing nondescript with useful workers. The breeding of high-class birds is a branch in itself, and, although attempted by too many people, still remains in the hands of the really experienced. If everyone breeds birds for sale as stock birds, two things will happen, one being such low prices as to leave no margin of profit, and the other a general deterioration consequent on lack of proper knowledge of the subject. Of all domestic animals poultry are most prone to deterioration through bad methods of breeding. There is always a strong tendency to reversion which, owing to rapidity of breeding successive generations during a comparatively brief period, soon becomes very marked. Haphazard breeding will never give satisfactory results. Selected birds only should be bred from.

For laying we may select the best common laying hens, and mate with certain pure male birds, and only the eggs of this mating are incubated.

For table bird breeding we again select our most suitable hens, and mate them with a pure bird calculated to improve the quality and quantity of flesh. These breeding pens should be kept yarded separately from the common flock.

ACCOMMODATION.

In far too many cases the fowls and turkeys are allowed to roost in cart and machinery sheds, and in stables. The practice is a bad one, and such places are in a filthy condition, and often swarming with vermin.

Houses.—On large areas the houses should be portable—either on wheels or with handles—to admit of being moved from place to place. It is a great advantage to give poultry fresh ground from time to time, as land saturated with their excreta is apt to lead to sickness. Vermin must always be guarded against, as their ravages cause enormous losses every year; therefore the construction of poultry-houses should afford as little harbor for them as possible. Galvanized iron, although the first cost may be considerable, is the most satisfactory. In case a house constructed of iron, with no woodwork, becomes infested, it is a simple matter to roast all vermin in a few minutes. This cannot be done with other descriptions of building such as are in general use. Where space is limited, and each flock is enclosed in a wire-netted run, overcrowding should be guarded against. Ever with scrupulous attention to cleanliness not more than 100 fowls can be kept continuously on an acre. It is a good practice, where several flocks are kept separate, to arrange them in small yards communicating with a large run, which can be occupied for a certain time by each flock in succession. On extended areas no subdividing fences are necessary, as, if the various flocks are properly spaced, there is no fear of mixing.

VARIETIES OF PURE-BREDS.

Numbers of people have a poor opinion of the value of pure-bred poultry, founded on insufficient data. Years ago, when the Asiatic breeds were popular, their apparent large size attracted great attention, and specimens or eggs were eagerly secured. As layers they were poor as a rule, and were large eaters; while so slow of growth were they, and so indifferent was the quality of their flesh, that they took low rank as table birds. The result

of mixing them with farm poultry was disastrous. There are certain breeds which can always be used to improve the quality of farm poultry, but at the same time it must be noted that, while some tend to increase the size of birds and improve the quality of their flesh, the egg yield may diminish, as the table qualities only are improved.

Again, other breeds will improve the laying qualities of the resulting progeny, at the same time decreasing their value as table birds.

There are certain breeds which can be recommended as all round farmers' fowls, but it must be understood that a first-class layer and table bird is not the usual combination.

Laying Breeds.—As previously remarked, laying is a matter of strain more than breed, and by careful selection it is easy to raise flocks of poultry whose average production of eggs is very high. Certain breeds are celebrated for the production of eggs, and may be valued in the following order:—Minorcas, Leghorns, Anconas, Andalusians, Hamburgs. These are all classed as the lighter breeds, and, with the exception of the last named, are grouped under the term *Mediterraneans*. Male birds of any of the foregoing, if of a good laying strain, mated with selected layers of barndoor sorts, will produce pullets which give increased returns. The progeny of such birds cannot claim to rank as table fowls, either in size or quality.

Table Fowls. In speaking of table poultry I refer to a higher standard than contents the average Australian. We must produce what is required by our customers, who demand high-class goods. They will buy what they want, not necessarily what we have to dispose of. Quality is thus of prime importance. For the export trade the standard must be high, and when I notice inexperienced people recommending unsuitable broods and their crosses, I regret that their knowledge is deficient. Those who have never seen good table poultry are naturally easily satisfied; not so the consumer who is accustomed to the prime quality. Unless we produce a good article, any attempt at catering for the export trade will result in failure. Barndoor mongrels are quite unsuited for the production of high quality table birds. Such birds should be plump, shapely, fine in quality, with white flesh and skin, young, and in good condition. The main secret in breeding for table is to have chickens or ducklings which mature quickly, and are in fit condition at the earliest age. Long-legged, scraggy, slow-growing sorts are neither suitable nor profitable. As a rule crossbreds—that is the first cross between two pure breeds—are the most satisfactory. We can depend on shape and quality, and the progeny are invariably hardy of constitution, and rapid in development. For first quality the crosses resulting from the mating of an Indian Game or Old English Game cock with Dorking hens are considered pre-eminent. Extremely satisfactory are the crosses resulting from the same male birds and hens of Wyandotte, Orpington, Langshan, and Plymouth Rock breeds. They are excellent in every way, and fit for sale at four months if properly fed, and are then quite large enough for export. The Dorking, as a sire, mated with the above-mentioned birds, gives splendid results also; so that there is a large selection. The Malay, as a sire, for crossing with the above breeds, has many advocates, but its characteristic length of legs places it in a much lower category. A low-set Malay mated with short-legged hens gives excellent results, but such Malays are not common, nor are they esteemed by Malay breeders. There is a great prejudice against leggy table fowls, and they certainly are unsightly. The meat should be chiefly on breast and wings—undue development of legs is not called for. I only advocate first crosses. When inter-crossing is resorted to it is of haphazard nature, and the results are various, indefinite, and unsatisfactory.

Water Fowl.—Duckling-breeding proves a very profitable occupation to many. Far less space is required, and as the ducklings should be fit for market at about nine weeks old, a very large turnover can be made during the breeding season. Experience has proved that a cross between the Pekin and Aylesbury is highly satisfactory, and I have inspected thousands of prime ducklings of this cross in Victoria and New South Wales, and the returns were highly profitable and satisfactory. Geese pay well for the local market, but the average bird supplied is very inferior, both as regards quality of flesh and size. The want of pure breeds is clearly indicated, and to do anything in the way of exports size and quality must go hand in hand. Goslings under 12lbs. weight are of no value for export. The Toulouse and Embden are the proper breeds, pure or crossed.

Turkeys will thrive over an extended range, but again I notice the absence of size and quality. Poor small birds result in poor returns, and yet they cost as much to breed as really prime young birds do. Turkeys do not stand inbreeding, the result of which is diminution of size and stamina. The mammoth American bronze turkey supplies the ideal breed. The mating of a selected gobbler of this breed with the largest common hens will give satisfactory results. For export the turkeys must be young and plump. The larger they are the higher the price, as they are sold by weight, and in the English markets the price per pound increases with certain weight limits.

Guinea Fowls are easily reared, and do no harm to farm or garden, and there is a good market for them in England and a fair one here. They are frozen and packed in their feathers, as is the case with game.

AGES FOR BREEDING.

For egg production the parents should be mature, and, if well grown, not under nine months old, if of the quick-growing Mediterranean breeds.

For table bird breeding, and for general purposes, a cockerel from 9 months to 12 months mated with second season hens is very satisfactory.

Geese and turkeys should not be bred from the first season—the stock is not satisfactory.

Food.

The knowledge of proper methods of feeding poultry is of prime importance, and is really worthy of separate and lengthy consideration. However, briefly, all food should be of the best, and sufficient in quantity to produce the required results.

Laying stock, growing stock, and the breeding stock all require modification in feeding.

Hens intended for the production of eggs for market give the best results if kept in flocks of thirty or forty. As these birds will not be bred from, no males are necessary; and, further, as eggs alone are wanted, the feeding may be stimulating. Soft food, such as bran and pollard, wheatmeal, barley meal, crushed oats, with or without copra cake, should be mixed with scalding water, and covered with a bag for a time to admit of swelling. It is then rendered, by addition of more water or more meal, as the case may be, of a crumbly consistency, so as to fall in pieces when dropped. Sloppy food is injurious.

For the morning meal, given as early as possible and fairly hot, give just as much as the birds will eat readily. Keep an eye for timid hens, which do not get their share, and look out for gluttons, which are always ready to eat and too lazy to lay eggs in return. If the birds are penned up they may have a sprinkling of grain at midday, such as barley or oats, and occasionally, as a change, maize or sunflower. Maize is a fat-former, and its continuous use is not to be recommended; as a change it has its value.

The evening meal may consist of wheat, sound and plump, and free from smut. Give a small handful to each bird. Definite rules as to quantity cannot be laid down: it varies according to breed and season of the year, and according to the supply of natural food. If the hens are laying well they may eat what they want in moderation, but, if otherwise, an increase or decrease is indicated; if the feeding has been liberal, the latter is generally the case. A supply of shell or bone-forming material is necessary to laying hens, and cut green bones: an ounce per hen twice a week will increase the output of eggs considerably.

Breeding stock should not be stimulated to excessive laying. Here we aim at quality and stamina in the resulting progeny. I favor grain-feeding principally, with a small mid-day feed of soft food. Vary the food, and give shell and bone-forming material, and but little green bone.

Growing stock require liberal and frequent feeding, taking care against over-feeding, and no stimulants of any sort should be given. Bonemeal made from steamed bones is of great value.

Grit, as an aid to digestion, should always be available, the harder and sharper-edged the better. Sea and oyster shells, old mortar and crushed bones, are valuable, and laying hens will eat quantities of crushed charcoal.

Green food should be provided daily.

Fresh clean water, carefully shaded from the sun, is of vital importance, as neglect leads to disaster.

In the foregoing I trust that, in the limited space of a paper, I have given the outlines of various subjects, each of which is worthy of very lengthy and minute consideration, and I hope further that it will be the means of inducing many to pay attention to poultry-breeding, and tend to a general improvement of farm stock.

There is one very important matter with respect to food. No soft food should be left unused. If you leave it about decomposition will set in and it will become sour, and diarrhoea and all sorts of diseases will result. I believe in the V-shaped trough. I do not believe in throwing any food about on the ground.

Mr. SAGE (Balaklava): I move a vote of thanks to Mr. Laurie for his very able paper. I fully believe he is right. Poultry can be made to pay and pay well. The year before last I made about £12 out of a few fowls besides the eggs we used for ourselves. The expenditure was less than £4 for the food for about twenty-three fowls. Last year we made very little short of £20 from about forty-five fowls. Some of these were pullets which did not commence to lay before April. This year, as far as we have gone, I do not think we have done quite as well because instead of keeping a few of the old mongrels for setting purposes we have got too many laying breeds, and when we wanted them we could not get broody hens. I agree with Mr. Laurie that fowls should not be allowed to roost on reaping machines. They should be

kept away from the house. We build a house every year for them and they are much the better for it. If fowls are looked after properly they must pay

Mr. J. MONFRIES (Gumeracha): I second the vote of thanks with pleasure. I am quite satisfied with the remarks made by Mr. Laurie. I came here under the impression that he might advance something in his paper that we might be able to criticise, but there is no scope for that to-night. There is one thing I would like to mention, and that is that eggs should be sold by weight.

Mr. WILSON (Port Pirie): The question raised by Mr. Laurie has been given considerable attention during the last few years. I would like to ask Mr. Laurie what sorts of fowls he would advocate for dry parts, as he has made a distinction between the dry and the cooler districts. Then I would like him to say something in reference to disease in fowls, and whether he would recommend salts for treatment.

Mr. LAURIE: I should recommend Minorcas, White Leghorns, and Brown Leghorns up there. They are an active fowl, and heavy breeds would probably die. You require some shelter up there. I have found that where there are arid plains to deal with it is advisable to make shelters of straw. You will find all the fowls under it in the hot weather. I saw that carried out in a very effective manner in Victoria. They had no great heat there, but they had the winds. There was a pen with three sides, with one end closed up against the prevailing wind. In reference to keeping the fowls in health, I would say that if you cannot grow green feed up there the next best thing is Epsom salts. It is better to give the fowls plain salts. It can be mixed up in a bucket of water with their food, and given to them once or twice a week. If there is disease there has been neglect in some way; either it is that there has been too much exposure, or there has been something in the food that has not been of the best. Possibly they have not had regular drinks. In short, disease is generally the result of some want of provision. Fowls should have healthy quarters, well ventilated and free from draughts, good wholesome food and fresh water. If these are provided there should be no disease at all. In the *Journal*, shortly, I am going to give careful consideration to all diseases.

The GENERAL SECRETARY: Mention has been made about green feed not being able to grow at Port Pirie. I do not see why they could not grow rape there; it will grow almost anywhere.

Mr. JORGENSEN: I think we have had a very able paper to-night, and one that we can get benefit from. Eggs are very cheap, and can be got at the present time for 2d. a dozen.

Mr. LAURIE: That is your own fault.

Mr. JORGENSEN: We cannot get rid of them.

Mr. LAURIE: Why do you not preserve them?

Mr. LAWRIE (Port Pirie): Mr. Laurie leaves us under the impression that it is necessary to cross more. My favorite breed is the Dorking. I have bought settings of eggs in Adelaide, and have sometimes got only two. I bought some Plymouth Rock eggs, and got two black chicks and two speckled ones.

Mr. LAURIE: Sometimes Plymouth Rocks throw black stock. That is how we get the Orpingtons. You should not blame the man who sold them. It has been my constant theme that we should get pure breeds. The Dorking has been a standard fowl. It is the breed of breeds; but people will not breed it properly; they will coddle it, and it will not stand coddling. The Dorkings are not what they have been in other years.

Mr. GUM (Amyton): I am thankful for the hints Mr. Laurie has thrown out. I have had experience in breeding fowls for egg-producing, for exhibition purposes, and for the table. I am surprised that Mr. Laurie should advocate keeping 100 fowls to the acre. I thought that, at the very least, they should

have five acres. In a small area fowls lose their producing capabilities. I have some guinea fowls, which are good egg-producers; but they are the greatest torments one can have on the farm. They chase the hens about, and if they are not laying they soon make them lay. I have argued that pure-bred fowls are not so good for laying as cross-bred fowls, because their constitutions are not nearly so strong, and they cannot stand disease so well. If you want good laying fowls you must have a first cross, not a hundredth cross. First cross birds are also good birds for the market. During the last two or three years I have been using Leghorns, but this year I am crossing Minorcas with Langshans, the one an egg producer and the other a magnificent table fowl. The main object of keeping fowls on the farm is for egg production, for the egg market is more easily dealt with than that for table fowls. Mr. Laurie mentioned Hamburgs. I have found them good layers, but the eggs are small, and no storekeeper will buy them unless by the pound. I admit that the origin of disease is the result of neglect, but if a disease breaks out in a district fowls will be subject to it, notwithstanding careful treatment. Up in our dry part of the district we have had some difficulty. Diarrhoea, roup, and canker have been prevalent.

MR. LAURIE: With reference to 100 fowls to the acre, it depends on how you keep them. I will keep 500 to the acre, and a man in London will keep 1,000. It depends largely on your country. Bay of Biscay land is unsuitable for keeping fowls on. As to guinea fowls, I always keep all classes of poultry separate. If you keep ducks and fowls together they will not thrive. Some gentleman said the price of eggs is only 2d. a dozen. That is your own fault; there are many ways of preserving them. You can get a tank of silicate of soda (waterglass); put your eggs in that for a month, drain them, and ship them to South Africa. Eggs treated with waterglass will keep for twelve months. As to cross-breeds, it would take a long time to say which is good and which not good. In speaking of Hamburgs, I should have said Black Hamburgs. Crossbreds certainly have more stamina, because it is well known that the mating of two pure breeds will result in the renewal of many lost qualities. Where you find pure-bred fowls that are weak and delicate it is the fault of the breeding. You can breed pure-bred stock as hearty as any mongrel that ever walked. As to the Minorca-Langshan cross, I think I can claim to be the first advocate of it in Australia. That was eighteen years ago, when we had not the proper Langshan here. Cholera is a disease that appears at seasons, and the germ is probably in the soil. I have been in disease-infested districts, but never had anything wrong with my fowls. Some people would never make a living at poultry, because they cannot notice anything wrong with the fowls. Roup and canker are common names for a variety of diseases that are not even yet understood, though they can be easily treated. Roup is often associated with diphtheria, and the man who gets roup fowls is likely to have his children taken with diphtheria. Eucalyptus is a very good remedy for roup in the early stages.

MR. F. THORNE (Angaston): I think farmers will take this matter up, but the market is too limited to raise table fowls. As to galvanized-iron sheds, I have heard it said they are too cold in frosty weather. Sometimes I give my fowls a little sulphur in the bran.

MR. LAURIE: England will take all the poultry we like to raise, but there is no market for rubbish. You want a fowl weighing 4½ lbs. or 5 lbs. for export. You can get a chicken of that weight at about four months or five months of age, and it is better to sell your fowls at that age and weight than keep them for nine months until they are 9 lbs. weight. They do not buy fowls in England by their size. They must be a certain class of bird, and we have to compete with people who understand the game. We have the advantage of getting the birds on the market at the season of scarcity. All can play at the game of

freezing, and they are storing in England; and it pays them to store for three or six months. Our local market will stand a good deal, but you should not put poultry of all ages on it. We have an inspector here, but I think he must be like Justice—blind. Cold will not hurt fowls, but a cold wind will. Sulphur in moderation is all right.

Mr. J. G. FOLLAND (Reeve's Plains): I have never found guinea fowls interfere with my hens. I am sure the address has been satisfying, and that we have learned a good deal. I am glad Mr. Laurie has praised the Dorking, and I agree with him when he says that if you want a change of blood you should buy a fresh cockerel every year.

Mr. R. EDWARDS (Murray Bridge): I would like to ask Mr. Laurie what water is most suitable for fowls—well water, rain water, or water from the reservoirs.

Mr. LAURIE: If birds are used to rain water it is well to give it to them for a time. If you take birds from one district to another you should for the first week boil the water. The water supplied to Adelaide and most of the country towns is suitable for poultry. It should be kept cool and out of the sun. That is more important than anything.

Mr. LAURIE, in reply to a written question, said: Someone asks how to prepare a nest for sitting, and whether the ground and the eggs should be damped. All nests should be on the ground; I certainly would not wet the eggs. You all know the principle of the butter cooler or water bag. It is evaporation for the outside, and if you wet the outside of an egg you set up a rapid evaporation, and the germ will become chilled and die. You had better loosen the ground around the nest and water that.

The GENERAL SECRETARY: I have been here since January, 1839, and my father had some of the first Dorkings that ever came to South Australia. After he kept them for many years they went to Wellington, on the Murray, and I believe some of the progeny are there still. We also kept a considerable number of guinea fowls, which were great birds for making a noise and laying away from home. The eggs are of a superior character and the flesh is gamey. I have had a good deal of experience in raising fowls. I found that Leghorns will lay anywhere. The Dorking is the fowl I would recommend for the farmer.

Mr. P. COCKBURN (Strathalbyn): I would like to ask Mr. Laurie his opinion of the Dorking and Plymouth Rock cross. This season I introduced two new roosters. They took cold, and it ended in the swelling of the eye. Would eucalyptus cure that?

Mr. LAURIE: Yes; I do not think the Dorking and the Plymouth Rock is the best cross. It is not the best for export.

Mr. COCKBURN: What is the best cross?

Mr. LAURIE: Indian Game and Dorkings, but it is difficult to get good Dorkings. In the case of pneumonia bathe the fowl's eye with warm water with a little eucalyptus in it.

The motion was carried.

FRIDAY MORNING SESSION.

Open Parliament.

An open Parliament for fifteen-minute discussions was held.

Working Fallow Land.

Mr. GUM (Amyton) dealt with the question "Is it advisable to work down the fallow fine immediately after ploughing up?" He said: My experience has been that it is not advisable to do so. Rather that it is advisable to leave the land as it is turned up by the plough. All through the summer months it

will receive the air into it and take in the rain much better. Of course, I am living in a dry district, and you must take that into consideration. I am asking for my own district, and not the southern districts where they have a great amount of rain. I have ploughed strips of land, taken the harrow and pulverised it thoroughly immediately after ploughing. Then a strip of land has been left just as it was turned up with the plough. I used the skim plough to put the seed in, and the result was I find it advisable to leave the land in the condition that the plough left it.

Mr. A. GOODALL (L'askeville): I may say that I have had a good deal of experience in reference to fallowing. I find that the land requires to be fallowed early—as soon as possible after the seeding is finished. We find it best in our district to leave the land stop for four or five weeks after ploughing, and then harrow down, and a little later give it a thorough scarifying. I believe if this is done the farmer will find out that his fallow will be tip top.

Mr. KELLY: I would like to know the nature of Mr. Gum's soil.

Mr. GUM: Chocolate loam.

Mr. ROWE (Quorn):—I think it depends upon the part of the country in which you reside as to how you should work the fallow. (Hear, hear.) It depends a great deal on the farmer's skill and judgment and observation; with different districts there must be different methods.

Mr. DOWNING (Kamantoo): My experience has been that it is best to keep the land as loose as you possibly can.

Mr. C. W. SMITH (Stockport): There is one point I would like to call attention to. If the land is dirty—and unfortunately we are getting pretty well smothered with weeds of different kinds—and is just ploughed weeds will not readily germinate; whereas if you work the fallow down and get a good tilth there is a better chance of the weeds growing and being destroyed before the crop is put in.

Mr. McEWIN (Brinkworth): I believe all fallowing ought to be finished by the end of July. The work afterwards depends upon the condition of your land with regard to weeds. There is no doubt that a fine tilth is a good thing.

Mr. GRAVESTOCKS (Riverton): I was very short of feed in the dry season. I ploughed my land and put the harrows over it and I got the best crop I ever had in my life.

Mr. W. GUM: I am pleased with the discussion that has taken place and, while I have the utmost respect for the opinions some have expressed, I intend to stick to my own ideas, as I have heard nothing to cause me to change my practice.

After Effects of Fertilisers.

Mr. J. W. DALL (Nantawarra), said: The subject I have to deal with is "The after effects of fertilisers on the stubble and the pasture." A great many of our members have not realised yet that the manure is going to return us a very fair amount of income apart from the increased crops. This has been fairly demonstrated at Roseworthy College, but there are many members who are sceptical with regard to the effect of fertilisers, and in many cases I think they have not realised that they are going to get something more than the increase in crop itself. The effect of fertilisers at Roseworthy has given the idea that manure has been put on there in such abundance that it is impossible for the average farmer to use it to the same extent. It may be that we cannot afford to manure so heavily as they have done at Roseworthy, but that does not say we cannot benefit to a considerable extent by using the fertiliser as we have means and opportunities for doing so. (Cheers.) The best plan would be to give my own experiences. I am an average farmer, and my means are limited. Last year we fallowed and worked a paddock of something like 200 acres, and put it under wheat. The crop was a fairly good one and returned some-

thing like 16bush. Part of it we cut for hay and another part we stripped. The after-growth on that land paid for at least half of the manure. (Cheers.) I think I would not be far out if I said that this year the feed was worth all the manure. In the early part of the season we had some fairly good rains and very soon the feed was up. The stubble was still on the land, and the effect of that stubble seemed to be wonderful upon the growth of the feed. We were feeding our cows on hay, and in May it was just useless to put hay over to them—there was so much hay in the paddock. On 115 acres we had ten cattle and fifteen horses, and from that time until now we have had splendid feed. I would like to emphasise the fact that there is better feed on land where stubble is grown. I think members will find that a very considerable benefit will come to them in the after effects of the fertiliser. (Cheers).

Mr. J. BROWN (Port Elliot): I have used manure pretty freely, but find some people are still sceptical as to the after effects, especially where heavy dressings are used. I use manure every year and am quite satisfied. If I had the money to pay for the manure I would use up to 2cwts. per acre or more.

Mr. A. GOODALL (Paskeville): We find we get double the feed after a manured crop; in fact, more than that. Last year I had a paddock out for feed, and it grew so luxuriantly that I drew a barbed wire across and left it for hay. There were a couple of strips I missed with the phosphate, and in the hay harvest the difference could be seen over half a section away. There was not a quarter the crop on these strips that there was on the part that was manured. Some in my district still hold the idea that the effect of fertilising will remain for a year or two, and that then the land is spoiled. That is all nonsense. We had it proved in Professor Lowrie's lecture that the land will still retain its producing qualities even better than if the manures were not used.

Mr. W. JAMIESON, M.P. (Gumeracha): The best example we have had of the after effects of fertilisers has been the growth of summer weeds or summer fodder, such as the hog weed or wire weed, which is of great advantage to the dairying industry, and serves as good as a crop of lucern. The after effect has been a great advantage to us.

Mr. HENRY KELLY (Central): At Strathalbyn a man said he could keep two sheep where one was kept before, and he found the same benefit in the second year.

Mr. A. L. McEWIN (Brinkworth): The after effects are so great that the profit from the feed is often nearly as great as that from the wheat itself. (Hear, hear.)

Use of Phosphates.

Mr. LITHGOW (Red Hill) initiated a discussion on "The quantity of fertilisers to use per acre." He said: I want the opinion of the members as to whether we should use 1cwt. or more per acre. In my district the quantity of phosphates used is from about 40lbs. to 80lbs. per acre. Some seem to think that we should use a larger quantity.

Mr. GOODALL: I think it is the farmer's duty to try these experiments himself. Two years ago about 80lbs. to the acre were tried at Paskeville. This quantity was doubled, that is to say 150lbs. or 160lbs. I watched the result closely. I did not notice any difference in the crops until about this time. The 80lb. crop appeared to give the same growth as the 160lb. crop. When the dry weather started—I remember we had a dry spell in August—I noticed at once the difference. The heavily-manured crop seemed to be growing hearty, and the dry weather did not seem to do it as much harm as that where the land was treated with 80lbs. only. Last seed time twelve months I tried the same experiment and I am sorry to say it failed. I have good reason for that. The crop did wonderfully well up to the end of September and the beginning of October. We had dry weather early in October. We had terribly severe

frosts and these bit the heavy growth down worse than it did the light. Had it not been for that the heavily-manured crops would undoubtedly have been the best. It would have paid me well had it not been for this, because I would have had from 3bush. to 4bush. extra from the heavily-manured land.

Mr. ROWE (Quorn): In regard to the frost biting the crop I think it would be possible to avoid that by commencing a little later. I think it would be a good plan to have two paddocks—an early and a late one. By that you will be able to judge as to what would be the proper time to put the crop in.

Mr. BROWN (Port Elliot): Touching this matter about heavy manuring. I think a farmer ought to experiment himself every year with little patches, and see what is best for his district.

Protection of the Crow.

Mr. McEWIN (Brinkworth): I move that "The persistent advocacy by the General Secretary for the protection of the common crow is in the experience of those present not justified." If there is anything I admire the General Secretary for it is that when he has an opinion he sticks to it. But there is no reason why we should not differ from him. I may be pardoned for altering the scriptural quotation and making it, "Where the carcass is there will the crows be gathered together." I know the crow. (Laughter.) If it were not for the crow I would have to pay an income tax to the Commissioner, for he kills the lambs and takes all the eggs. I wish I had Mr. Molinoux at my place for a week with a gun.

The GENERAL SECRETARY: He would not shoot them.

Mr. McEWIN: I question that—if we did not give him eggs for breakfast. Notwithstanding the laughing it is a serious subject. I do believe the crow is one of the worst enemies the farmer has got.

Mr. R. CAMPBELL (Millicent): I second the motion. I am glad it is brought forward, because the crow is no friend of mine. I would kill every one on the place.

Mr. J. BROWN (Port Elliot): The crow is a very bad animal; there is no doubt about that. (Loud laughter.) If you sow oats broadcast the crow eats the lot; if you sow them with the drill there is not so much danger. If you have any young chickens or young ducks the crow kills them. I make a practice of shooting crows, and I object to them being put on the protected list.

The GENERAL SECRETARY: The crow has proved himself to be a better animal than Mr. McEwin, who says the crow has taken every one of his eggs. He must have been a very poor sort of a man if he cannot protect his fowls' eggs against the crow. If people would study the crow, and magpie, and others, and see what they do all the year round, they would form the same opinion as I have. There is no necessity for bringing this matter before the Congress.

Mr. J. W. DALL (Nantawarra): We have a kind of grub, a green grub, which is very destructive. I believe the crows are beneficial in removing these grubs, and I am satisfied the grub is a greater enemy than the crow. (Cheers.) It is only a few odd crows that take to robbing nests and working destruction about a farmyard. We have adopted a plan of dealing with these at Nantawarra. We set rat-traps, and the crows find it awkward when they get in. I would not, however, advocate the destruction of crows.

Mr. J. B. ROWE (Quorn): I live in a part of the country where the crow is a necessary evil. I am not a protector of the crow, yet in many cases he is very useful—that is, the good he accomplishes quite outbalances the evil. The crow is good in eradicating the caterpillar, which last year ate down 300 acres of grass that a farmer protected for his sheep. Instead of having the privilege of

putting his sheep and lambs in this paddock, he had to stand by and see a kind of black caterpillar take all the grass. The crows at the same time were busy eating the caterpillars.

Mr. JORGENSEN (Mount Remarkable): A windmill with a kerosene tin on the wings will frighten all the crows away.

The CHAIRMAN: I have always favored the crow, because it has been found that it is a great devourer of insects.

Mr. G. TEAGLE (Kapunda): The crow is the greatest evil we have. It takes the eyes out of the sheep and eats all the clean wheat.

The GENERAL SECRETARY: The motion is that the crow be not protected.

The motion was carried by thirty-four votes to fifteen votes.

The "Journal of Agriculture."

Mr. ROWE (Quorn): The subject I wish to discuss is in reference to the printed matter that the *Journal* contains. The matters contained in the *Journal* are very often not touched upon in our Branches, and this is not as it should be. The members of our Branch are fully alive to the necessity of preserving their *Journals*. For my part, I make a practice of reading it thoroughly, because I realise its value. The matter should be well studied. There is necessity too for better care with our *Journal*. They should be preserved, so that a subject can be turned up at any time. Very often the papers in our *Journal* are never touched upon at the Branch meetings. The papers are generally by men who know what they are writing about and who generally bestow much time upon it.

Mr. R. CAMPBELL (Millicent): We bind our *Journals*, and nearly all the members have a bound volume. It is a splendid plan for preserving the *Journal*.

Dry Milking versus Wet Milking.

Mr. W. BRICE (Mount Bryan East) initiated a discussion on the question "Is dry milking preferable to wet milking?" He said: We all dry milk, and have never found that the cows were any more fidgety with dry milking. The cows' teats do not crack as they do with wet milking.

Mr. J. BROWN (Port Elliot): A good deal was said about dirty milking here the other day. If you milk with wet teats you cannot help getting dirty. I think dry milking is preferable to wet. It would not crack the teats, and wet milking is likely to do that in frosty weather.

Mr. G. TEAGLE (Kapunda): I have kept milking cows for the last twenty years. I have tried both ways, and have come to the conclusion that a man should wash the teats before he milks. If he afterwards dresses them with a little hog's oil they will be all right.

Mr. W. CORNISH (Gumeracha): I have had experience in milking cows all my life time. If you wash the teats and hands you will have clean milk and clean hands. Dry milking takes half as long again.

Mr. GRAVESTOCKS (Riverton): I maintain that dry milking does cows more injury than wet milking.

Mr. D. LITHGOW (Redhill): I have always adopted wet milking. If you milk dry the dirt drops off into the milk just the same.

Mr. A. L. McEWIN (Brinkworth): I have milked since I was 5 years old. It takes longer to milk dry than wet. If you take a wet cloth and wipe the teats you get no dirt and the milk will be quite clean.

Mr. P. COCKBURN (Strathalbyn): I am much in favor of wet milking.

The resolution in favor of wet milking was carried by a large majority.

The GENERAL SECRETARY: Mr. Thomson favors wet milking with cleanliness.

Circulating Libraries.

Mr. CAMPBELL (Millicent) moved—"That this Congress considers that every Branch should have a circulating library for the use of its members." He said: That subject, I believe, was first brought up at the Millicent Branch, where we have a good library, which we find exceedingly useful. We have a stock of books on subjects that are of importance to farmers, and, as I mentioned previously, we have the *Journals* bound, and this is a great advantage. I would like to see all the Branches take this matter up. If this were done they could all be sent to one bookseller to bind, and we could then get the work done cheaply. I would very much like to see the movement for the establishment of circulating libraries started.

Mr. H. F. L. HOLZGREFE (Millicent): I second the motion. It would undoubtedly be a good thing, because by co-operation the books can be purchased much cheaper. For instance, we have a book in our library on the management of horses. It is only a small book, but cost something like 9s. 6d. In a circulating library a very useful collection of books could be got together.

Mr. W. CORNISH (Gumeracha): I think it is a splendid idea to bind the *Journals*, because by so doing they can be kept and handed down to posterity.

Mr. McEWIN (Brinkworth): We have an annual meeting and make it something of a social gathering. At that meeting we make a charge. At one meeting we raised over £4. I am thankful to Mr. Campbell for his idea.

Mr. ROWE (Quorn): I do not think a levy should be made on the members. It should be by subscription. We have adopted a plan that each member pay 2s. 6d., and unless he does that he cannot become a member.

A DELEGATE: That is wrong then.

Mr. ROWE: We have found it work admirably. Since our Branch was established we have never met anybody who refused to pay 2s. 6d. They give it cheerfully. The secretary is the treasurer, and with the chairman and a committee appointed for the purpose of dealing with all correspondence so that it can be dealt with at once. This works out admirably. We in Quorn have the public library. Our meeting place is adjacent to it. Our *Journals* are bound and laid on the table, where they can be seen by anybody who visits the place. Other similar literature is displayed. All our members are subscribers.

Mr. CAMPBELL: The advantage of a circulating library is that you can take the books home to read for a certain period. In this case too the books can be on distinctly agricultural subjects.

The motion—"That this Congress considers that every Branch should have a circulating library for the use of its members"—was carried by a large majority.

The Professor of Agriculture.

Mr. S. SCHINCKEL (Naracoorte) moved—"That in the opinion of this meeting the department should arrange for the next Professor of Agriculture to travel more and conduct experiments in different districts." He said: Ninety per cent. of the farmers will agree that Professor Lowrie and the Agricultural College have done a great deal for the State. The northern farmers have received greater benefit from the Professor's lectures than the farmers in the South-East. I reside in the South-East, and it is not generally a wheat-producing district. I think we can greatly improve our positions with very little cost to the department. I would suggest that the Professor conduct experiments other than at Roseworthy College. Let some farmer provide the land, do all the tilling, and take off the crop, but do it under the supervision of the Professor. Then, after the college work is done, let the Professor proceed to the South-East. The Education Department has established three agricultural classes in connection with our State schools. There is one at Jamestown,

one at Clare, and one at Naracoorte. The agricultural plots are very small, and it would be a great advantage to the young fellows if small experimental farms were conducted under the supervision of the Professor. In the South-East we want educating in the growth of fodder plants. If the motion is given effect to it will greatly help the Professor, because he has not had experience of the South-East. Professor Lowrie had to learn a great deal when he came to South Australia, and the next man will have to do the same, and he should have experience over the whole of South Australia. In the South-East we want fodder and grasses, because our main industry is grazing and fattening stock.

Mr. GRAVESTOCKS (Riverton): Professor Lowrie has had enough to do at the college without travelling round. If anything is done it should be a separate affair.

Mr. W. R. WHITAKER (Port Broughton): I think Professor Lowrie has done remarkably well. He went about a great deal, and was not above learning. I hope the next Professor will do the same thing, and that he will be as willing as Professor Lowrie was to do all he can for the farmers of South Australia. Professor Lowrie had too much work. We do not want any agricultural inspector. We have too many now. These agricultural classes might be conducted throughout the State, and I have little doubt but that something of the kind will be done. We could not reasonably expect any gentleman to travel more than Professor Lowrie did.

Mr. J. WYNES (Naracoorte): Some of the speakers seem to think we want to increase the expense, but that is not so. We are not depreciating Professor Lowrie's value, but the North and the South-East are very different, and we have not had the Professor as often in the South-East as they have had him in the North.

Mr. J. C. SYMONS (Crystal Brook): If some farmers in the South-East would give twenty acres of land, and some in the North give the same, the Professor could instruct them what to do with it and how to divide it up into plots, and that would be of considerable advantage to the farmers in the districts, and it would not necessitate any travelling. The Professor might not go on the land at all.

Mr. R. CAMPBELL (Millicent): Some years ago there were some plots conducted at Millicent, and one of the Agricultural College students was generally sent down to put in the crops, and when the crops were growing Professor Lowrie paid a visit to see how they were getting on. The interest taken in the plots and the lessons they taught were largely accountable for the use of commercial fertilisers in the drainage areas.

Mr. J. BROWN (Port Elliot): I have no doubt Mr. Rounsevell's motion dealing with the establishment of experimental plots will be carried, and if we pass a motion in favor of it it will assist it.

The motion was put in the form—"That the Congress is in favor of Mr. Rounsevell's proposition," and was carried by twenty-five votes to one.

Application of Fertilisers.

Mr. LITHGOW (Redhill): I wish to bring forward the question as to whether you should sow the manure broadcast or by means of the drill. A very sticky manure would not go through the drill. I would like to know some of the experiences of those present in this direction.

The CHAIRMAN: It all depends upon the condition of the land. If the soil is clean it is well to sow it broadcast. I know of a case where 12 bush. to the acre were obtained, but it was sown late in the season. Of course you could not expect to have a bigger crop on account of the lateness of the season. Where the land is dirty perhaps it would be advisable to use the drill.

Mr. BROWN: If the land is clean I do not think it matters a great deal whether the manure is sown broadcast or drilled in, but generally speaking I think you can get better results from the drill.

Mr. McEWIN: I am trying both practices, but so far the result does not display any marked difference. Of course I do not know what the result will be ultimately, but I cannot detect any difference in the two growths at the present time.

Mr. HOLZGREFE: I use the drill because I find sowing the manure broadcast dirty work. I certainly prefer the drill for other reasons.

Mr. DALL: I tried the drill last year, but we had some difficulty to get the manure through, and had in the end to give it up. Afterwards we sowed the seed broadcast on the drilled ground. The advantage was obvious. Even when the crop was reaped we could still see the advantage in the stubble.

Vote of Thanks.

The **GENERAL SECRETARY:** I have my annual duty to perform of proposing a cordial vote of thanks to every person who has taken part in these proceedings, and more especially to those who have prepared papers. We have had a most enjoyable Congress, and it has been a record one for orderliness. I must compliment you on the good order you have maintained. Of course I include the chairman in the motion.

The motion was carried with acclamation.

The Congress was then dissolved.

CONFERENCE OF HILLS BRANCHES.

The Sixth Annual Conference of the members of the Hills Branches of the Agricultural Bureau took place at Mylor on September 27th, one having been held at Clarendon, three at Cherry Gardens, and one previously at Mylor. The following Branches were represented:—

Mylor: Messrs. E. J. Oinn, J. Roebuck, W. H. Hughes, F. G. Wilson, J. Nicholls, F. G. Newberry, W. G. Clough, Wm Nicholls, Seth Roebuck, T. J. Mundy, P. P. Probert, J. Smith. **Cherry Gardens:** Messrs. C. Ricks, T. Jacobs, J. Lewis, C. Lewis, W. B. Burpee, A. Broadbent. **Clarendon:** Messrs. J. Wright, J. Spencer, H. Payne, W. A. Morphett, E. Dunmill, A. L. Morphett. **Forst Range:** Messrs. John Green, Albert Green, H. H. Waters, W. MacLaren, R. E. Townsend, George Monks. **Belair:** Messrs. George Wescombe, H. Halstead, W. J. Bartlett, G. R. Laffer. **Mount Compass:** Mr. F. McKinley. **Visitors—**From Central Bureau: Messrs. A. Molineux (General Secretary), T. B. Robson (member), George Quinn (Horticultural Instructor), G. S. Thomson (Dairy Instructor); also several friends, including ladies, from the localities represented by the members present.

EXHIBITS.—Flowers and foliage by several members. By Mr. C. Ricks—Oranges and lemons of good quality, grown by himself at Cherry Gardens. By Mr. Roebuck—Excellent onions and two sorts of potatoes, grown at Mylor.

The chair was occupied by Mr. C. Nicholls, who very shortly introduced the objects of the meeting, and called upon Mr. E. J. Oinn to read the following paper:—

Cultivation of the Soil.

To properly cultivate the soils of the Mylor blocks probably costs more in labor and cash than in any other part of this State, and even when it is cleared, dug, and planted it requires a continuous large expenditure of labor and manures to maintain its proper condition for the growth of trees and other plants. The man who fancies that he has only to take up a block of land and live on it for a year or two in order to make a fortune will soon become disillusioned, and will arrive at the conclusion that his fortune is still a large way off. There are

some blockers who are endowed with a little extra energy, and the less diligent decide that he has a more favored spot than the rest, and so naturally he ought to succeed better; but they neglect to note the amount of labor he has devoted to his land, and the money he has spent on manures to bring it to the present state of fertility. When he first took up the block it was as poor as the rest, and had as much scrub on it. Mylor blocks have to be well cleared before the soil will produce even a little grass, and must be thoroughly prepared and manured before fruit and vegetables can be grown. From all accounts, land in most other parts of the State do not require half the preparation or manuring before a good crop of wheat can be secured, provided there is a sufficient rainfall; but here we get plenty of rain, and in most places enough water. The trouble is that in some places there is too much water in winter and difficulty in getting enough of it on the land in summer. The winter flow leaches out a good deal of the plant food and this is a source of considerable loss. Some of the land is suitable for market gardening if properly fenced, trenched, and manured, but the major portion is very suitable for fruit-growing. For fruit, it should be broken up from 12in. to 18in.; timber and brushwood should be cleared off and burned, and the stones either removed or built in terraces. After the land is prepared the trees should be planted. The best manure is about 4lbs. bone-dust annually for each tree. Drainage is important, especially in the gullies. Underground drains are good in some places, but in most situations open drains are much better. In draining a slope it is important to have them run diagonally, or across the slope at about 16ft. apart, on a gradient that will carry the water slowly away. Such drains will cut off and carry the seepage from above.

In answer to questions, Mr. OINN said the Mylor soils are chiefly sandy on a yellow sandy-clay substratum, with much stone in most places; and the gullies were mostly peaty. He thought an open drain is best, because it is not so likely to become choked with sand, and the saving in this way compensates for the surface taken out of cultivation.

Mr. LEWIS, Cherry Gardens, considered there is much loss of cultivable surface where open drains exist, and they also get choked up with rubbish, which entails much labor in clearing.

Mr. J. ROEBUCK agreed with Mr. Lewis. One could plough over covered drains, and they do not get choked if properly made.

Mr. C. RICKS advocated covered drains. The open drains do not aid in the aeration and sweetening of the adjacent soil. The large stones were very useful in the underground drains.

Mr. OINN said it was easy to construct covered drains in clay or peaty land, but where there is a lot of fine sand adjacent to a drain it is carried along with the water and the drain becomes choked; especially does that occur when irrigating.

Mr. ANTUAR recommended open sumps or pits at intervals along covered drains, so that if there were any stoppage it could be located without having to open the whole length to find the obstruction. In peaty land there would be very little danger of filling up. Teatree and similar brush could be used advantageously in covered drains.

Mr. A. GREEN, Forest Range, said he had noticed that open drains dry the soil too much, whilst covered drains maintained a moist condition in the beds.

Growing Potatoes.

The next paper was read by Mr. SETH ROEBUCK, as follows—

In growing potatoes our aim is to grow the largest crop of good potatoes at the least outlay both in manure and labor, and to get them into market when they will bring the best price. Local potatoes generally bring the best price from July until Christmas. In places where they can be planted without much danger from spring frosts the end of August or early in September is the best time to plant early-maturing sorts, of which I think Beauty of Hebron and White Elephant are about the best. Unfortunately those varieties have of late years been subject to a disease called "black spot," which often spoils the crop if we get cold weather when they are about the flowering stage. Both the above are excellent potatoes, and will be ready for market before Christmas when planted by the second week in September.

For main crop I think Flourball, Prolific, and Brown's River are among the best sorts, but for the latter variety the land must be in good heart. I tried Jewel's last season; they are a very hardy sort, and are a long time growing, but for cropping and for cooking qualities they

would be hard to beat. I intend to give them a good trial this season. For an autumn crop Prolific is about the best I know; they will throw a good crop in any reasonably good soil, will stand the cold and wet of late autumn, are a good average size, and sell very well.

To grow potatoes well stable manure should be used, if only for alternate crops; or a green crop may be grown and turned in. Being a long way from Adelaide, and unable to get a sufficient quantity of stable manure nearer, I have tried several commercial manures—kainit, muriate of potash, sulphate of potash, sulphate of ammonia, &c.; but the results in every case were discouraging. Potatoes grown alongside with equal quantities of bone superphosphate and unsteamed bonedust gave about equal results; and as we do not exhaust the bonedust in one crop, as we do the more soluble superphosphate, I think bonedust is the best manure to use in our wet district along with stable manure, or alternately with stable manure, half a ton to the acre of bonedust being a fair dressing. Manure fresh from the stables should be spread over the ground in the autumn and scarified in, so that it gets mixed with the soil. When left in heaps to rot before using much of its value is lost.

Whether the ground is dug or ploughed, it should be well pulverised about 9in. deep. A good way to do this is to use a short mouldboard plough, which breaks the ground much better than a long mouldboard. Plough about 6in. deep, follow in the furrows with a horsehoe with four narrow tines; this breaks up the hard pan without turning the subsoil on top. By this means the ground is as well worked in the bottom as if dug. Take wide furrows, and plant the setts in alternate furrows 12in. to 14in. apart. If using bonedust I spread it in the furrow with the potatoes; the next furrow is turned on the setts, turning the dung or green crop just where it will be available to the crop when wanted. Harrow with light harrows after a few days, and again just as the potatoes are coming through the ground, to kill the young weeds. When the potatoes are about 6in. high deep-hoe them. The horsehoe with narrow tines does this very well where it can be used; mould them up to save the tubers nearest the surface from turning green.

I think it pays to save our own seed, with an occasional change; otherwise we have often to pay a high price, and then not always get good ones. Seed about the size of a hen's egg, and cut in two, do very well for spring planting. For second crop it is best to get the seed from the Adelaide Plains. They may be planted in January or February, and unless there is rain it will be necessary to water these to give them a start. The ground should be dug or ploughed, then drilled shallow; and if bonedust is to be used, sow it in the drills and dib in the potatoes with a spade; then run the water down the drills.

This crop may be left in the ground until August, unless the ground is too wet. If the land should be too wet to leave them in it will pay to dig them, put them in heaps of about half a ton each and cover with earth, and market them about July or August.

Mr. J. McKINLEY, Mount Compass, spoke of the necessity for deep planting of potatoes in soils such as prevailed in his locality on the drained Black Swamp. These were deep peaty lands, full of fibrous remainders of root growths of reeds, rushes, and small trees and shrubs, and it was essential that the setts should be deeply planted, and there was no necessity for hilling or earthing up. The tubers formed on the stem between the sett and the surface of the soil. The fibrous roots do not extend to any great distance.

Mr. T. JACOBS, Cherry Gardens, had been growing potatoes for more than forty years, and said the fibrous roots do not extend to any distance; therefore hilling up would not remove rich soil from their feeding points. The tubers are always produced near to the surface. In spring he would plant his setts 3in. to 4in. deep. Moulding up may be dispensed with in some localities, but in other places it is necessary.

Mr. ROEBUCK said there is a difference between White Elephant and Beauty of Hebron, although latterly a good many growers have expressed doubts whether these two names do not apply to the same variety of potato. White Elephant is not as blue in the flower as Beauty of Hebron, and White Elephant has a high narrow ridge over the eyes, which is not so marked in the other.

Mr. GEO. WESCOMBE, Belair, disapproved of deep planting. His best crops had always been planted shallow. There was not much benefit to the crop in hilling, but it made the digging much easier. He thought there would be a lot of extra work in digging potatoes planted 8in. or 10in. deep. Those which grew exposed to the light, of course, acquired a green color, and were partly spoiled.

Mr. T. B. ROBSON, Central Bureau, said White Elephants were at one time distinct from Beauty of Hebron, but now there appeared to be no apparent distinction.

Mr. G. QUINN had found rather deep planting was advantageous, because that enabled him to constantly work the soil and thus maintain a moist condition. He had to cultivate in a dry locality west of Adelaide.

Mr. L. A. MORPHETT, Clarendon, could not grow potatoes well without plenty of stable manure. He had tried superphosphate, nitrate of soda, and muriate of potash, but stable manure gave him best results.

Mr. G. R. LAFFER, Belair, said a solution of 1oz. of corrosive sublimate in 8galls. of water had been strongly recommended as a remedy for black spot in potatoes. The setts should be soaked in it for half an hour.

Mr. H. R. ANTUAR said that there would be no black spot on land in which salt or lime existed. Growers should try experiments with a few rows. He did not believe black spot was a fungus disease, but was the result of a change in the starchy constituents of the potato.

Mr. E. J. OINN said the disease started at the base of the stem and extended to the leaves, ultimately destroying the plant.

Explanations were here made by various speakers. The disease affecting the substance of the tubers was not yet identified—not yet traced to a fungoid or to a microbic origin. The disease called "black spot" was distinctly attributable to a parasitic fungus, and could be checked by early treatment with Bordeaux mixture. The soaking of potato setts in a solution of corrosive sublimate had been recommended for prevention of a skin disease of potatoes called "scab," but its efficacy had been disputed, though there were many who held the contrary opinion.

Mr. WESCOMBE had tried soaking the setts in corrosive sublimate for black spot and found less disease. He was convinced the germs of the disease were attached to the setts or tubers. He had procured fresh seed potatoes of Beauty of Hebron from Victoria, and they were doing splendidly with no signs of disease.

Mr. MORPHETT had found that potatoes grown under trees which had been sprayed with Bordeaux mixture were less affected with black spot than the rest of the crop.

Mr. LAFFER contended that the seed should be treated, and that little or no benefit would result from sprayings after the plants were attacked. The same rule applied to fungus disease of potatoes as to shothole, curl-leaf, &c., of fruit trees, which must be sprayed with Bordeaux mixture when the buds begin to swell—neither before nor after.

Fruit-growing, &c., for Market.

The next paper was read by Mr. C. Ricks, of Cherry Gardens, to the following effect:—

He believed that there were some kinds of fruits that could be more extensively grown in South Australia with advantage to growers and consumers. He quoted Customs returns for 1900, which showed that there were imported 892,499lbs. currants, 129,915lbs. raisins, 24,683lbs. other dried fruits, 4,480lbs. fruit pulp, 77,406bush. fresh fruits, and 83,273lbs. preserved fruits. He believed we could grow currants, raisins, lemons, and oranges in many parts of the State, especially in the hilly country, where there is excellent soil for the purpose. He directed attention to some oranges and lemons which he had grown at Cherry Gardens, and upon being tested they were found to be excellent. He thought South Australia ought to export largely of raisins and currants, instead of importing them. It was well known that the currants and raisins grown in South Australia are better than the imported, and sell at 2d. per pound higher price. The hilly district, being later than the plains, could supply oranges and lemons when the plains crops were used up.

In fruit canning, preserving, and drying great progress has been made during the past ten years. If these articles are well prepared and neatly got up there will be a much larger consumption by our population. The introduction of the American berry boxes and crates has

more than doubled the sale of strawberries, because they can be placed on the table now in all their perfection of form, flavor, and freshness, instead of being crushed and spoiled as they used to be when sent to market in large boxes. Other devices of a similar nature that are used in America could be adopted in marketing raspberries, currants, peaches, apricots, and similar soft fruits with equally advantageous results.

The method of marketing dried fruits is by no means uniform, nor are the packages usually appropriate. When dried apples, peaches, apricots, plums, and similar fruits are sent to market in old gunny bags they are sure to be covered with fluff and fibre—to say nothing of dust and dirt—and the appearance and value thereof is very considerably depreciated. The contrast is shown in a few instances where dried plums neatly packed in 7lb. boxes are being sold at 7d. per pound. The same kinds of plums before being dried have been sold for years past at prices ranging from 1s. 6d. to 4s. per kerosine case—say 50lbs. Probably many small growers could not afford to dry and pack their fruit in the most approved manner, but by uniting they could set up the proper works and appliances, and their fruit could then be got up in the most attractive and perfect manner, and it could be sold at rates which would be advantageous both to the grower and to the consumer. At Renmark and Mildura there are drying and packing unions which have secured a first-class reputation for the dried fruits of those localities. Where each small grower deals only with his own fruit there is no chance of securing the merchants' attention, be the quality and get-up ever so good, because their lots are so small, and no one can be bothered with small lots. We have some fruit factories in the State, but where they are ten to twenty-five miles distant from the orchards the growers can make no use of them. If the fruit were picked when properly ripe and carted that distance over rough roads it would be spoiled ere it reached its destination, and we know that fruit must be ripe in order to make perfect preserves, &c. What we lack is co-operation in establishing drying, preserving, and packing works in each centre of fruit-production.

How to Utilise Codlin Moth Affected Fruit.

The CHAIRMAN then called upon Mr. Geo. Monks, Forest Range, to read the following paper to be discussed in connection with that of Mr. C. Ricks:—

I take this opportunity of strongly condemning the way some growers in the hills have of dealing, or, perhaps to be more correct, misdealing, with their “grubby” fruit. It is a practice with some to pick up the fruit and stack in heaps near sheds, or more frequently pigsties, and feed to pigs at intervals, thus allowing the caterpillars to escape unchecked.

It is difficult in many cases to treat the affected fruit as it should be treated; but the fact remains that unless this matter is properly attended to the pest will not receive the check that it otherwise would.

There are several ways of treating the affected fruit. One is by immersing in water, and for this purpose either a tank or large tub is required; but, unless the fruit is first placed in good, sound, strong bags, a well fitting cover is indispensable, else the grubs will escape. The fruit will require to remain in the water not less than forty-eight hours, and by that time it is pretty safe to assert that either the caterpillars are smothered in the fruit or have crawled out of it and become drowned in the water. If this mode is adopted great care should be taken to place the cover on as soon as the fruit is deposited in the water, as the grubs soon begin to move to shelter.

Another way, and one that I favor most, is putting the fruit in good sound wheat bags, or cases, covering with bags or some woollen material, and examine the bags or coverings at intervals of a few days, and it will be found that the grubs are in possession of the bags or coverings and can be readily destroyed; the great advantage of this system being that the fruit is not damaged by water, and is therefore on that account more valuable and fit for manufacturing purposes. The cost and labor is not so great as immersing. The only objection might be that it would take a little longer; but the advantages more than counterbalance the disadvantages.

Another method is boiling the fruit, and this is a very safe one, as it ensures the speedy death of the pest. Boiling should be resorted to when it is intended to feed to pigs. Scalding is another way which, if thoroughly done, would be sure, but care must be taken to do it well. Other ways of treatment are by burning and burying, but as this means a lot of unprofitable labor, and is also a great waste of valuable food for animals, it is not worth advocating, excepting as a last resource, particularly if burying is done great care must be taken to bury deeply enough, or the result will be disastrous.

It is a great mistake to put all the eggs into one basket, and it is absolutely necessary, where there is an orchard of any extent, at all events, that pigs should be kept, as in any case there is always a lot of affected fruit not fitted for any other purpose than to be fed to pigs; that fruit, for instance, which is affected by the first broods of the moth. But it must be borne in mind that boiling or scalding and mixing with other foods is requisite, as there is very little nourishment in the fruit at this stage.

Later on, when the fruit becomes developed and after receiving the already mentioned treatment, thousands of bushels of affected apples, instead of it being sought to fust them upon the markets, could, with advantage and profit to the grower and all concerned, be manufactured into vinegar, and the best of vinegar too. Instead of the community consuming the rubbish in the shape of acid and water, the real stuff could be had with just the trouble of manufacturing and distributing. Every grower could at least make all he would want for home consumption if no more.

All growers could and should dry, preserve, and make all they require in jams, jellies, &c., and certainly the factories could utilise more in this way than is done at present.

Cider-making could also be started in the hills with a certain amount of success, notwithstanding the opinions that we do not grow the right kinds, that the sun scorches them too much, and that codlin moth fruit is no good for cider-making. There is very little doubt that if the public of South Australia once got a taste of real good cider, and it could be obtained at a reasonable cost, so much rubbish in the form of drink would not be used. I am convinced that if our affected fruit were treated and utilised in the way indicated there would not be the same fuss and trouble as at present *re* the sale of it.

In considering Mr. Ricks' paper, members mentioned that bananas formed a considerable portion of the imported fresh fruits, and as we do not grow bananas this item would not be decreased by any efforts of our growers. Pineapples also could not be profitably grown here, and a considerable quantity of currants, raisins, and dried fruits came from Renmark and Mildura, which would naturally detract from the deductions arrived at from a cursory glance at the Customs returns.

Mr. W. H. HUGHES said apples could be fed with advantage to cows, and there was no case that he ever heard of where apples caused choking.

Mr. T. B. ROBSON said the imported raisins were chiefly selected table raisins. Of ordinary layers and pudding raisins there were more than sufficient grown in the State to supply our markets. As for currants, they were being sold retail at 5½d. per pound. They were realising 2d. per pound more than the Greek currants, which had to pay an import duty of 2d. per pound. The imported currants could be put on our wharfs at 1½d. per pound, but, notwithstanding that, if our Federal Parliament maintained the import duty, there was scope for development of the currant-growing industry in Australia.

Mr. QUINN—*Re* lemons, our growers make a great mistake in failing to harvest their fruit at the right time. Lemons should be clipped when they begin to show the first sign of turning yellow; should be handled with most tender care, as the slightest pressure at the time of gathering will cause a bruise of the outer cells. Place the fruit in a cool shady place, and leave there for a few days until the peel has transpired some of its moisture and become toughened; then place them in single layers in trays or boxes in a cool cellar or room, where they will keep good for several months. Cider vinegar is now being made by several of the large apple-growers, and it is of excellent quality. In centres of apple-growing it would be of considerable advantage to unite and establish cider-vinegar factories. The expense of the works is not great; but it would not be advisable to allow fruit to be carried long distances to such factories, even if it would pay.

This concluded the morning session, and members adjourned to lunch; after which they went over the hills on a visit to the Government typical orchard, where they spent an instructive and profitable hour with Mr. Holtze inspecting and comparing the numerous type specimens of fruit trees.

Some Principles Underlying Pruning.

At 3:30 p.m. the Chairman called the meeting to order, and Mr. GEO. QUINN, Government Horticultural Instructor, read the following paper:—

As a rule fruitgrowers are much more skilled in the performance of the actual work of pruning than they are conversant with the principles upon which the various operations are based. Owing to this there is a lack of continuity in the results obtained, and much disappointment and dissatisfaction is experienced. While never losing sight of the fact that we

are growing fruit trees for the returns they yield in the shape of good saleable fruit, we should also keep in mind that the trees possess certain functions which must be exercised fully if they are to live to a profitable age. Although the treatment of every tree, and even each branch of any particular tree, differs in detail, and differs again under varying conditions of soil and climate, still, underlying all of this, there are general principles the applicability of which are practically unvarying.

As pruning means either the reduction or subjection of some part of the plant, and as most of the parts operated upon are above ground, we will first deal with the foliage.

- (1) *Under ordinary conditions the vigor of a plant, or of a shoot, is in direct ratio of the leaf surface upon it.*

We all know that the leaves take in carbon dioxide from the air, and after fixing the carbon, release the oxygen into the air again. This is only part of their mission, because they likewise are the principal medium of transpiration of moisture. This moisture is obtained from the soil, and in it in a dissolved condition are the necessary mineral elements drawn from the soil. When this solution of crude sap reaches the green parts it is by intricate processes combined with the carbonaceous compounds to form the fully elaborated sap with which the tissues of the plant are built up. The excess of moisture drawn up is then transpired into the air. We thus see that no elaboration of sap—which, when solidified, alone adds an increase to the plant, whether it be root, stem, branch, or any other portion—can take place without leaves. The greater the leaf surface, then, the greater the elaboration of sap and increase in the vigor of the plant.

- (2) *The nearer a shoot approaches a vertical position the stronger will be the growth; and*

- (3) *The nearer a shoot approaches a horizontal position so its vigor diminishes.*

These are founded on the unvarying law in nature which causes the sap in plants to flow most strongly to the highest point of growth. The truth of these principles is seen in the greater strength shown by vertical leaders compared with the lessened vigor exhibited by the more horizontal laterals.

- (4) *The lesser the number of buds upon a branch the stronger will be the growth made by each individual shoot arising therefrom.*

This is partly the reason why the stems or shoots of young trees are shortened back to a few buds when we wish to start a limited number of stout foundation shoots or main arms. When established trees are filled with weak twiggy wood, we prune out large quantities to induce a lesser number of strong ones to start. Sometimes fertilising the soil will produce a similar effect without pruning, but the vigor and extension is confined to a lesser number of shoots than formerly.

- (5) *If the root system be reduced the extension of the top growth will be checked in proportion.*

This is the principle upon which root-pruning is based. Under normal conditions there is a balance between roots and tops. The previous rule showed how, when the roots held the balance of power, strong top growth was forced so as to regain an equilibrium. This rule 5 is simply the converse side. The reduction of the moisture absorbing root surface lessens the possibilities of sap elaboration. This checks the extension of the top growths. Another common instance of this is seen in the young trees transplanted from the nursery. In lifting them from the nursery the root system is much curtailed by being broken or cut. To assure an even start gardeners reduce the tops in proportion, and thus strike a balance between the absorbing and the transpiring and elaborating surfaces.

- (6) *When a number of shoots are growing at different levels upon the same plant, generally the topmost shoot absorbs most sap, and outgrows those below.*

We see this borne out on every plant, where no two shoots are of equal vigor. On newly set trees we desire as even a balance as possible, and this tendency must be frustrated by pruning during the period of growth. This is practised in the direction of pinching out the growing points of the more advanced shoots from time to time. This temporarily checks the strong to the advantage and encouragement of the weak shoots.

- (7) *The fruit-production of any plant is in inverse ratio of its activity of vegetation.*

This principle is founded on the fact that fruit-production is an attribute of moderate vigor rather than of rank growth. We notice how the strong growing vertical shoot rarely fruits until its vigor is diminished. The bloom buds though formed upon such rarely persist into fruits. This happy medium of "moderate vigor" is the condition ever sought in growing trees profitably. To maintain it we must observe each tree and each variety and prune it in accordance with its condition. When the vigor declines and the fruits become inferior we must induce a renewal of vigor. To do this we reduce the number of buds upon the tops by

reducing the spurs, laterals, or leading shoots, just as the case demands. Other things being equal, the tree responds by yielding more invigorated shoots. When our trees lean to excess of growth we should prune lightly or not at all. In this respect the judicious reduction of the leaf surface by summer pruning, fracturing, ringing, or incising the bark, &c., produces the desired effect. The principle contained in rule 5 also offers a solution of the difficulty. In the drier parts of this State, however, there is considerable risk in the application of root-pruning.

(8) *The smaller the number of fruits the greater their volume and size.*

We see when the number of fruits are reduced by accident, design, or the operation of natural laws how those remaining increase in size. The thinning of peaches and apricots is a familiar local example. The enhanced value owing to the increase in the volume and size of the fruit is only portion of the gain. The lessened number of kernels and pitted due to thinning off the fruits is calculated to conserve the energies of the tree and lessen the drain upon the soil. It is possible to elaborate and extend these principles considerably, but those given here cover most of the ground. They are the outcome of carefully recorded results and observations of capable men made over very long periods.

In answer to questions, Mr. Quinn would try to check over-luxuriance in peach trees by stopping excessive water supply, if such existed, or limiting manure, or, if these checks could not be put in force, would root-prune, or try the effect of running a single cut with a knife through the bark of stem or limbs to check the upward flow of sap for a few days. When the sap flows slowly the tree will set and mature fruit. To ensure annual crops on any fruit tree, do not allow it to bear at any time too heavy a crop. Thin out a lot of the fruit, when a heavy crop has set, and it will be found that the weight of fruit will be as heavy, though the number will be less. It is the production of seeds that weakens a tree and prevents the production of heavy crops for two years in succession. The time to run the knife around the limbs or trunk would be when the sap begins to rise.

Mr. ANTUAR reminded hearers that the leaves of any plant are essential to its existence. Heavy prunings or removal of leaves during active growth would, in either case, tend to decrease vigor and vitality by upsetting the balance between root action and leaf action. Young trees should be allowed considerable leaf-production, otherwise there could be no robust growth in limbs and trunk.

Mr. T. JACONS, Cherry Gardens, approved of ring-barking fruit trees when they failed to bear. He has a pear tree which would not bear fruit, and he chopped the stem all round with an axe. This was done several years ago, and it had borne good heavy crops of fruit ever since. He chopped pretty deeply too.

A member said he had a pear tree which failed to bear, and he cut back the roots on one side one year and the other side the next, and now the tree bore good crops.

Mr. QUINN explained that the crude sap flows upwards in the cambium layer, and the elaborated sap flows back in the young inner bark. In ring-barking (or cincturing) a strip of bark no wider than the back of a table-knife is removed, taking care not to injure the cambium wood layer.

Mr. WESCOMBE asked how many years should be devoted to "forming" a young tree, and remarked that if this were kept up too long, and none of the forks removed, the tree would soon assume the appearance of a birch broom, so that no light could get into the central branches.

Mr. LAFFER said it is necessary to remove most of the new sub-divisions after the third or fourth year. To cause the formation of fruit-spurs on apple trees in place of branches the breaking or fracturing should be done when the sap flow is nearly stagnant. If rain or other stimulating influences occur afterwards the growth may recommence. The broken-down piece should not be totally removed until winter pruning, and then the broken end of the stub should be left. If pruned back to sound wood the top will probably start to reproduce the branch or limb.

Mr. MONK said that in well cultivated orchards the growth continues longer or later than in those that are more or less neglected. For that reason pruning should be left to a later date.

The CHAIRMAN here requested members to fix locality for the next annual conference, and it was decided that it should take place at Forest Range.

The members then adjourned for tea.

The Dairy Cow.

The evening session commenced at 7.30 o'clock, when Mr. Geo. S. Thomson, Government Dairy Instructor, gave the following address:—

The quality of the milk yielded by cows in South Australia is exceptionally high, which we attribute to the large percentage of Jersey blood that exists amongst herds, and to the nourishing properties of the herbage throughout the State. But the percentage of fat could be increased, and the yield of milk (which on the average is low) could also be increased very considerably. To succeed in accomplishing this task let us consider the chief objects to be aimed at.

First, the farmer will only buy cows belonging to good milking strains of stock, and to assist him to purchase useful animals he will apply his practical knowledge of the chief points commonly found in the best milkers.

Now let us see what these points are. First, the buyer will look for the chief characteristic of the milking breed, and that is the wedge shape. In discussing this striking feature every one will agree to its prominence in Jersey, and more especially in Ayrshire cows. When looking at these animals you are struck with the light fore part of the body compared with the deep hind quarters; while if you turn to the fattening breeds of cattle, such as the Shorthorns (Booth's) and Herefords, you will find that the shoulders are heavy, and that the wedge shape does not catch the eye. In the case of fattening stock the shoulders are fleshy and flattish, while in the milking breeds they are free from much flesh. By the application of what has been already said you are in position to distinguish between the two classes; and to further assist the buyer in avoiding mistakes let him give a preference to the cow with the long neck to the one with the short compact neck, which denotes a fattening quality. We will now consider the importance of depth in hind quarters. For a moment recollect the size of the hind quarters of the heaviest milkers known to you, and you will agree that these animals represent the type I am now talking of. Again, call to your memory the tucked-up leggy cow, and if she is a heavy milker, remember that her life as a profitable cow will be short. You must have this deep appearance in your cows if they are going to last, and if you are to breed sound and profitable heifer calves.

We will now consider the udder of the cow, which is too frequently neglected by the intending purchaser. The udder should be of good shape, not over-balanced; it should be well forward and well back, without being crushed by the want of space between the hind legs. Look for fine silky hair and the development of milk veins, and do not be easily satisfied about the soundness of each teat. Teats should be large enough to ensure comfortable milking and of uniform size—be suspicious of a short, stunted teat, which should not be seen on the udder of the good cow. You might pursue your examination of the milk veins and find their entrance with the chest wall. Be satisfied if the openings are large, if small the possibilities are a small return of blood from the udder.

Being satisfied with the examination of the cow as far as these points are concerned, do not forget the temperament of the animal. Do what you can to ascertain if she is nervous, as all of you are aware that a very timid cow is much against the success of efficiency in milking. Consider her parentage—that is, the qualities of her sire and dam, which go a very long way to establish a profitable dairy cow; and, lastly, exercise vigilance as to the health of your intending purchase.

In consideration of what I have said, remember that these points are not infallible; but if every owner of a cow studies the instruction given he will be in a more reliable position to judge the qualities of the milking stock.

We have now arrived at a branch in our subject that is of vital importance to the industry, and one that is neglected very much. In many instances neglect results from an erroneous belief that feeding is attended with loss—that it is impossible for the cow to return in milk what is given to her in the value of food. I certainly agree that it is out of place to feed the fat cow with rich rations, because she will not utilise the food substances for milk formation, but will store it up as fat and flesh. But we have not to deal with many of these cows in this State. For at least eight months in the year animals are not overburdened with the weights of their bodies. What I know is this, and I am convinced that farmers will agree with me, that the majority of our cows do not receive the amount of food that they require to keep up their bodies and at the same time meet the demands of milk-production. What allows lack of meeting the requirements of the animal? She falls away in her milk flow and

also in the quality, and a continuation of scanty feeding causes her to dry off much sooner than she would do if the food supply had been more abundant. In other words, and I say this without fear of error, that 80 per cent. of the cows in this State do not yield their maximum quantity and quality of milk at any period throughout the year, and that the shrinkage amounts to a loss of many thousands of pounds annually. In extensive experiments which I conducted in different parts of the State, conclusive evidence was given to bear out my contention. Let me explain briefly what was demonstrated. In a branch of the experiments, cows were fed on rich rations, and the demands of each animal satisfied. The milk from both the morning and afternoon milking was weighed and tested for quality. At the conclusion of a period of testing it was found that the quantity and fat percentage of the milk had increased, and that the cows showed an improvement in appearance. At the termination of two months these animals gave a higher standard in their milk returns than they did before the commencement of the tests, notwithstanding that some of them were over 200 days in milk. The cost of the feeding for the first six weeks of the experiment for four cows amounted to £3 17s. 7d., and the price obtained for the produce during that time was £14 19s. 10d. This test was being prosecuted at a period of the year when paddock fodder was out of the question, so that the animals were dependent upon the rations allotted to them. Let it be asked how would those cows have fared without the hand-feeding when herbage was scarce and innutritious? I think the answer is clear to every one and needs no further explanation. Another test carried out with four cows that were fed on rich rations gave results showing that the animals had practically reached their maximum attainments prior to the commencement of the experimental feeding. In this case it was the custom of the farmer to hand-feed morning and afternoon and study the wants of each cow. The lesson got from the test was a valuable one, and was practical evidence of past teachings. Not only was it found impossible to raise the standard and quantity of the milk of these four cows to a marked extent, but it was found that each cow maintained a similarity in quantity and quality of milk morning and afternoon for a period of thirty days, which was the duration of one particular ration. Three of those four cows were from 226 to 235 days in milk at the commencement of the experiment, and at the end of seven weeks' testing the weight of milk had only fallen by 5½lbs. in the day, and the weight of butter had increased by 3lbs. in the week. To give an idea of the value of the feeding of those four cows let me quote the following figures. The weight of milk for seven weeks was 5,288lbs.; weight of cream, 498½lbs.; weight of butter, 287½lbs.; cost of feeding £4 4s.; and price realised for the butter manufactured, £17 18s. 9d. In the experiments the weight of food given to each cow per day was about 23lbs., which included moisture, the food being damped each evening with warm water, and had the hay been grown on the farm the price of food per cow per day would have been about 3½d.

Before considering this last branch of our subject, let me say a word or two about the changing of the food in the animal's body, and what reference it has got to the milk yield and its quality. As the cow picks up her food from the ground she does not masticate it, but passes it over into the first stomach, where it is afterwards returned to the mouth for proper rumination. When this takes place the animal is said to be chewing her cud. As the herbage is made fine enough it is passed into the true or digestive stomach, where it is acted upon by juices and changed into a condition that fits the digested food for assimilation into the blood stream. In the blood the nutriment is carried into the udder of the cow, where certain substances are removed to be turned into milk. What is not required passes along the milk veins which are seen on either side of the udder, and is returned to the heart. Now, when a cow receives rich food the rich constituents favor a better quality of milk and a healthier body in the animal. How the milk is manufactured has not been clearly shown, but what is known to milkers when a cow keeps up her milk proves that the nervous system is a governing medium in the secretion of the fluid in the large glands situated in the udder. From this practical knowledge we learn that it is necessary for us to treat the milk cow in such a way that disturbance of the nerves will be avoided, and before and during milking special attention is demanded to carry this into effect. I think everyone is perfectly clear on this point, at least on the evil influences that follow unkind treatment of the cow. Not alone is kind treatment essential to success in milking, but regularity in the times of milking is a point that I wish to impress upon all owners of dairy stock. It will interest you to know that the extensive experiments which I have already referred to have conclusively demonstrated that a cow will yield milk of similar quantity and quality from day to day, and for a considerable time, if she is properly fed, watered, and milked at equally balanced hours morning and afternoon. In these experiments four cows were milked at the same hours morning and afternoon; each animal received an equal weight of food at each diet of milking, and for thirty days the quantity and quality of milk was practically the same. The following are the figures:—

	Weight of Milk.	Weight of Butter.
	lbs.	lbs.
First week	742	42
Second "	742	42½
Third "	742	41½
Fourth "	742	42

Two other lots of cows were milked at unequal hours morning and afternoon, and the weights of milk did not correspond, neither did the percentages of fat. In most cases there was a difference of 2 lbs. of milk in favor of the morning's milking, and 1.5 percentage of fat in favor of the evening's milking. After further extensive tests the hours of milking were demonstrated to be the chief factor in bringing about the changes mentioned.

Just as feeding and hours of milking influence the yield and quality of milk, cleanliness in milking is to a great extent responsible for the keeping properties of the milk. Let every one firmly believe in what I have remarked; but should some be of a different opinion, I would recommend them to carry out a simple experiment. Milk a cow without attention to cleanliness of the udder and teats, and devote no particular care to avoid the hands becoming dripping over with milk. Remove a sample of the milk in a clean vessel and keep it until acidity is detected; note the time taken for the taste to develop; pour away the milk, and note the sediment of dirt at the bottom of the vessel. Milk the same cow, but brush and damp the udder and flanks and wash the teats; milk with the hands moistened with water; use the same vessel that has been sterilised, and place the milk in the same room; note the time it takes to become acid, and observe the absence of a sediment. It is the sediment of dirt that is so commonly found in milk vessels that tells us that proper precautions have not been adopted in the milking of cows, and we know that milk cannot possibly remain sweet as long as dirt is allowed to find an entrance into the milkpail. With these very important points attended to, the competent milker will milk each cow smartly, balancing the vessel as he proceeds, so that too much milk is not taken from one part before changing to the other teats. On no account neglect to thoroughly strip.

In the discussion which followed some important points were considered. The system of wet milking found unanimous favor from those present, and, in explanation, Mr. Thomson stated that the system did not imply that the hands of the milker must come into contact with the milk, neither was it meant that the hands should be wet and dripping with water. Milking with the hands moistened in clean water is the correct meaning of the term, and should be practised wherever a cow is kept. He had often said that the word "moist" should be substituted for "wet," and if this were done mistakes in milking would be prevented.

It was asked if feeding the cows with rations at the time of milking was recommended to feeding before milking?

Mr. THOMSON said that the practice of giving the cows meal rations at the time of milking was commonly done in the State, and in the recently conducted experiments the results were favorable to a continuance of the practice. At the same time it does not altogether seem a natural procedure, and it may occur that some cows will be a little reluctant in yielding their full supply of milk; others again, of an irritable temperament, would be satisfied, and in such a case the system of feeding would commend itself. It seems, however, that this question depends to a great extent on the early feeding of the young cow—whether she has been taught to receive her ration before, during, or after milking—and he would recommend buyers of single cows to make inquiries on this point, and if the previous system has been successful then continue it if satisfaction is given. He might mention that the feeding of cows on large quantities of cabbages, rape, sour silage, and green lucern just before and at the time of milking is liable to give a taint to the milk supply, and for this same danger it should be remembered that the above foods should be served to milking stock but sparingly at all times.

To the question, for how long should a cow be dry before calving, and, in the case of a heavy milker, would you advise to dry off if she yielded a fair quantity of milk shortly before calving? Mr. Thomson said, a cow should be dried off at least six weeks before calving—this being done to give the animal an opportunity of getting up the system, which is sometimes run down as a result of heavy milking; also to provide the necessary nourishment for the unborn calf. Some cows are difficult to dry off, and would yield a supply of milk up to the date of calving. In cases like this it is advisable to leave a little milk in the udder at each milking, and, when the supply has shortened, milk but once a day, but be careful to strip thoroughly at the final drying off. Neglect

to do this is very liable to cause irritation in the teats, and eventually a closing up of the duct may follow, which is known as a blind teat. Take notice of the clots of milk that are usually removed at this last stage. He felt convinced that the secret of prevention of blind teats is to be found in getting rid of this coagulated or inflammatory-looking milk. In some instances cows are dried off by giving a purgative such as Epsom salts, but it should not be practised unless all other efforts have failed.

To the question, "How does molasses compare with copra cake as a food for milking stock, and what is the difference in their relative values?" he replied that the composition of molasses does not favor milk-production to any marked extent, but is given principally for its healthful properties. It forms a splendid component in a ration, and is to be recommended at a time when feed is dry and innutritious, and of a character that helps to cause the disease of impaction in stock. On the other hand, copra cake has powerful milk-stimulating properties, and its good qualities have been demonstrated in the feeding experiments. It must, however, be given to cows in small quantities, beginning with $\frac{1}{2}$ lb. and gradually increasing to 2 lbs. or a little more per day. Compared with molasses, copra cake is rich in albuminoid, or flesh-forming constituents, and also in oil. Molasses contains a high percentage of sugar or carbonaceous matter. The value of a meal or cake for milk-production is usually based on its albuminoid percentage, and in green fodders we have an illustration of this in the quality of lucern, which is reputed to be the richest fodder crop cultivated. For further consideration of sunlight oil cake (copra), he would refer those present to the *Journal of Agriculture*, giving a full account of the feeding tests, or to the pamphlets already distributed.

Replying to the question, "Would the feeding of cows for six months on a rich ration and then changing the food to one of poor quality—would not the milk supply suffer and also the cow?" Mr. Thomson said, to feed cows for six months on a rich ration is not a customary practice, and if done there is reason to believe that cows would favor a change in food. He had all along recommended changing their rations from time to time to prevent a fall in the yield and quality of milk, and to feed according to the beef-producing qualities of the cows. If a cow has a fattening tendency, six months on a rich ration would, in all probability, cause an overweight in flesh and inactivity in the glands of the udder. Again, some cows do not relish rich rations, becoming soon tired of them; hence the desirability of introducing new food stuffs of a poorer quality. They were all aware that cows respond freely to changes in paddock feeding, even when they are removed from the rich herbage to that of the poorer quality, and in our milking experiments it was clearly demonstrated that an alteration in the weekly food proved profitable, not only in maintaining both quantity and quality in milk, but in proving beneficial to the health of the cows. To those who feed their cows with Sunlight oil cake (copra), he would advise them to mix it with bran and chaff and a small quantity of salt, and moisten the whole mixture with warm water at night, and give this to the cows in two diets, morning and afternoon. He had proved that more good is obtained from the copra when it is fed as stated.

A number of other questions were put and answered, and after a vote of thanks the proceedings closed.

COLIC, FLATULENT COLIC, AND GRIPES IN HORSES.—Give a purgative of 1 pt. linseed oil and 2 ozs. laudanum. Apply hot water to the abdomen, and inject large quantities of warm water (at about 100 deg. F.). Give as a tonic 1½ ozs. spirits of ammonia, 2 ozs. laudanum, 2 ozs. carbonate of soda, 1½ ozs. ginger, and 1 qt. of hot ale. Give 2 drms. of nitrate of potash in water occasionally for the water. At most country stores proprietary remedies for colic are also obtainable.

CENTRAL AGRICULTURAL BUREAU.

MONDAY, OCTOBER 21, 1901.

Present—Mr. F. E. H. W. Krichauff (Chairman), Sir S. Davenport, Hon. A. W. Sandford, M.L.C., Messrs. W. C. Grasby, M. Holtze, R. Homburg, M.P., R. Marshall, T. B. Robson, C. J. Valentine, and A. Molineux (Secretary).

New Member of Central Bureau.

The HON. MINISTER OF AGRICULTURE notified that Mr. R. Marshall had been appointed a member of the Central Bureau in place of the late Mr. Samuel Goode.

The CHAIRMAN welcomed Mr. Marshall on behalf of the other members.

New Branches.

Approval was given to the formation of additional Branches, as under:—

ARDROSSAN.—Members—Messrs. G. J. W. Freeman, Chas. Cane, Chas. Dinham, Jno. Henderson, Jas. Hill, S. Alderman. E. Bowman, W. Lodge, Jas. Cornish, T. H. Davey, G. E. Wood, Jas. Wilson, R. Dinham, and N. Opie.

SADDLEWORTH.—Members—Messrs. W. H. Bee, J. H. Frost, G. Bengier, F. Coleman, J. P. Daley, W. Hannaford, W. Heaslip, F. Plant, R. Townsend, F. Waddy, and J. H. Eckermann.

KINGSTON.—Members—Messrs. F. W. Barnett, T. A. McCulloch, G. Bird, A. Hutchinson, H. Thredgold, R. Flint, E. M. Flint, G. Barnett, F. S. Wight, W. W. Pinches, and T. Redman.

Forest Tree-planting.

The CHAIRMAN tabled a paper on this subject, and referred to the necessity for greater attention being paid by the Government and the people generally to the planting and care of forest trees. Larger areas of the existing reserves should be planted, and more encouragement given to private planters.

The SECRETARY said that the poor results of planting trees received from the Forest Department had to a considerable extent discouraged planters. Farmers that lived considerable distances from the nurseries often received their trees in poor condition, and unless a very favorable season was experienced most of them died. This was due to no fault of the department, but simply to the long delays that were unavoidable. It would be a good plan if the Bureau could arrange to supply seeds of forest trees to members of Branches willing to raise plants and distribute them free of cost.

Mr. HOLTZE thought they should ask that the Forest Department be granted a certain sum annually for planting new areas of country. Instead of planting a few acres, as at present, it would pay the State to plant miles of trees.

Mr. MARSHALL agreed that it was better to raise the trees on the farm than to obtain them from the forest nursery. If the farmer raises the plants he can set them out at any time when the weather conditions are suitable and he has the time to spare. He had experienced no difficulty in raising plants himself.

Codlin Moth Traps.

The CHAIRMAN introduced Mr. A. Preiss, of Norwood, who showed and explained the working of a trap he had manufactured for catching codlin moth and other caterpillars, curculio beetles, &c. The trap is made of galvanized iron, and is in the form of a circular trough to hold water. It consists of two parts, which by an ingenious arrangement fit round the trunk of the tree, any

space between the trap and the tree being filled up with paper, sand, or other material. Anything crawling up or down the tree was caught and drowned in the water. The traps cost 2s. 3d. each, but if there was a large demand for them he believed he could supply them at about 1s. 3d. each.

The SECRETARY mentioned that traps to prevent curculio beetles crawling up the trees had in many instances disastrous effects. The beetles when they found they could not pass the barrier gnawed the bark below, girdling the tree. He failed to see how it was going to catch codlin moths, or many of their caterpillars, as the former did not need to climb the trees, and the majority of the latter reached the ground other than by crawling down the trunk. Similar methods had been adopted to prevent ants and aphids from climbing the stems of peach trees. These traps would probably prove useful in trapping other insects, but the cost was prohibitive.

Several members pointed out that the cost, which would amount to from £10 to £15 per acre, was too great, although it was possible that the traps might prove useful. It was considered that at any rate they were worth trying, and if found as successful as was claimed, the question of cost could then be considered.

King's Early Wheat.

Mr. MARSHALL said he wished to refer to the question of growing King's Early Wheat. Owing to its hardness and good yielding qualities, Professor Lowrie had advocated its growth, which he was convinced was a great mistake. This wheat was grown to a considerable extent, and if sown over large areas was bound to have an injurious effect on the reputation of our wheat and flour. With a view to getting a definite expression of opinion on the milling qualities of this variety, he had written to a number of millers, and had received replies from several of the principal firms. Mr. John Darling did not approve of the wheat; it was a red coarse wheat and not a good milling variety. Messrs. E. Davey & Sons had used the wheat in considerable quantities, both alone and mixed with other wheats, but found it always deficient in strength and color. Mr. J. H. Both, of Caltowie, objects to the variety, and will not grind it if he can avoid it. The flour is too dark, and he does not buy it for shipping. The character of the berry was against the wheat, and it will be a mistake if it is grown in any quantity. Messrs. Deland & Black consider it too dark and hard, and not a good milling wheat. They had experimented with 100 bags of this wheat, fifty being new and the rest old wheat, and had sent flour to four different bakers in the city for report. The reply in every case was that the bakers did not want any more of this flour; the bread was too dark, and got dry very quickly, and on the second day it was practically unfit for consumption. In view of these reports Mr. Marshall thought the Bureau should discourage the growing of this wheat on a large scale.

Mr. GRASBY referred to committee appointed some months back to deal with the question of the improvement of the milling qualities of our wheats, and suggested that Mr. Marshall should be appointed to fill the vacancy caused by Professor Lowrie's resignation. Although they had been able to do nothing as yet, they should not let the matter drop.

Mr. MARSHALL was appointed as a member of the committee.

Renovation of Old Fruit Trees.

Mr. GRASBY stated that he had arranged to carry out experiments in several places in the renovation of old fruit trees. If desired he would conduct this work under the auspices of the Bureau, so that the Bureau might share in any credit that might be derived from this work. Mr. Grasby was thanked for his suggestion, which was accepted, and it was decided that if possible members should attend the demonstrations.

New Members.

The following gentlemen were approved as members of the undermentioned Branches:—Bowhill, Mr. P. Semmler; Wilson, Messrs. A. Smith, W. H. Neal, jun., and H. F. Nadebaum; Woolundunga, Mr. Blyth; Booleroo Centre, Messrs. W. Brooks and J. Albinus; Mount Bryan East, Messrs. Jas. Thomas, jun., G. Taylor, and E. S. Wilks; Mount Remarkable, Mr. W. Foot; Hartley, Mr. Wm. Cross; Forster, Mr. A. Johns; Reeve's Plains, Messrs. W. S. Corden, A. Arnold, W. Cawrsc, and W. G. Payne; Brinkworth, Mr. Alex. Horne; Hahndorf, Mr. J. G. Gallasch; Millicent, Mr. B. Crouch; Golden Grove, Messrs. W. Bartle and Jas. McEwin; Cherry Gardens, Mr. T. Paltridge; Forest Range, Messrs. E. Rowley, F. Green, and R. Green; Petersburg, Messrs. Jno. Pilkington, A. W. Jamieson, and M. Alford; Redhill, Mr. H. E. Kelly; Yorketown, Mr. A. Jensen; Morgan, Messrs. J. Pope and W. Jackett; Artherton, Mr. L. Crosby; Colton, Mr. H. Kleeman.

Reports by Branches.

The SECRETARY reported receipt, since previous meeting, of 158 reports of Branch meetings.

REPORTS BY BRANCHES.

Stansbury, September 7.

Present—Messrs. A. Anderson (chair), P. Anderson, J. Henderson, C. Faulkner, J. Antonio, G. Jones, H. C. Pitt, and P. Cornish (Hon. Sec.).

GENERAL FARMING.—Mr. Faulkner read a paper on this subject, to the following effect:—

Following should be commenced as soon as possible after seeding operations are finished. While the ground is moist it ploughs well, and the weeds will get a chance to grow so that you can clean your land. Early fallowing also conserves the moisture, and generally gives good returns. I invariably get double the yield from fallow compared with the land not fallowed. Since the seed and fertiliser drill has been used in this district farmers have been compelled to work their land better than formerly, with the result that the crops are better. I should recommend farmers to use the disc-drill in stubble and scrub land, as it wheels over and does not drag like the hoe-drill, and does its work equally as well as the latter in clean ground. I have generally used about 1 cwt. of super. per acre, but strongly support Professor Lowrie's idea of heavier dressing. The headlands sometimes get a little more manure than the bulk of the paddock, and in such cases you can easily see the difference in the growth. I have seen the drill go across the paddock without any manure, and at harvest time the strip is like a road through the crop. No farmer should have a butcher's bill; keep as many sheep as you can, but keep them well, and on no account overstock. The Merino is the best for farmers, as they are easier to keep in the paddocks. I consider dipping the sheep improves the wool and gives it a better lustre, besides freeing them from vermin. If kept free from tick and other vermin they will do much better.

Considerable discussion ensued, principally on the Merino *v.* crossbred sheep, but no decision was arrived at.

Booleroo Centre, September 28.

Present—Messrs. W. H. Nottle (chair), N. Clack, J. Repper, J. Michael, J. Clack, Dr. Steven, F. McMartin (Hon. Sec.), and four visitors.

THE BOY ON THE FARM.—Mr. J. Clack read the following paper.—

This subject has already provoked a considerable amount of discussion at other Branches of the Bureau. As its bearing is of direct importance to both old and young of the farming community, I should think it well worthy of our careful consideration.

Constant readers of the *Journal* will remember that papers contributed by various members of other Branches dealing with different phases of the subject have, in some cases, been blamed

for their absence of decorum; in others for their unnecessary sobriety. Generally speaking, however, I think it can scarcely be averred with truth that there has been a departure from in one case, or a very close confinement within the sober realms of fact in the other. There seems to have been a disposition on the part of some of its critics to regard a paper on "Our Boys and Girls," contributed by Mr. P. Lawson (of the Appila-Yarrowie Branch), as one which attempted to display only the most unattractive aspects of farm life, leaving unnoticed its broad redeeming features. This certainly may have appeared to some as a defect, and only a half truth, but the contributor ought scarcely to have been censured for writing of a black cloud in farming prospects if he really saw one. To say the least, his paper has been productive of the happiest results. Less pessimistic brethren have risen who, though not ignoring the presence of a cloud, say that if the writer of "Our Boys and Girls" had chosen he might have seen the compensating broad silver lining.

A most unfair statement was that which stigmatised Mr. Lawson's paper as "utter trash." The style certainly may have been somewhat flippant, and there may have been a great deal of humorous exaggeration employed, but there seems to be no real reason for holding it up as a protest against humor and an example of stuff to be excluded from Bureau discussions, or from the right of publication in the *Journal*.

Not entirely in defence of Mr. Lawson, but as a protest against such a suggestion, we might remind the critic of the trite but true saying, "Wit is the best sense in the world." How often a humorous statement fixes upon the mind something worth remembering, which something might, presented without humor, have been quickly forgotten. Has not Macaulay written, "I am not certain that the best histories are not those in which a little of the exaggeration of fictitious narrative is employed. Something is lost in accuracy, but much is gained in effect." The editor of the *Journal*, much to the critic's disgust, is evidently of the same opinion, for do we not find in the last issue of the *Journal* he has allowed the countryman to be championed by this remarkable statement, "A university graduate might use a buggy for a fortnight and not have the sense to oil it, and an M.A. find himself outwitted by a broody hen."

To return to our subject. Mr. Paul Lawson at least is serious when he writes, "Every one that gives up work as a producer is a distinct loss to the community." This rule is, I believe, admittedly sound, though it, too, has its notable exceptions. Mr. Paul Lawson is also serious when he writes concerning the tendency of the young on the farm to drift cityward. "This (the tendency) can only be stopped by making farm life more attractive than it is in the majority of cases." His critic accuses him of inconsistency, but his critic is inconsistent as well. On some points he takes Mr. Paul Lawson seriously; on others he does not. He suggests or supplies remedies for certain evils instanced, thereby demonstrating that he realises their existence. Mr. Lawson says, "They (the farmers) have dined in the paddock, perhaps under the shelter of a six-wire fence, if rain is falling, or standing up if the ground is wet." The critic suggests for the man of no resources that he might provide for himself "temporary shelter, if it were only an old reaper, to be shifted as the work progressed." A suggestion not without value. Adaptability to circumstance has made the reaper anything, from a boulder down to a fowlroost, and it may yet prove to man, like the oft-symbolised eastern rock—"a shade by day, defence by night, and a shelter in the time of storm."

Having dealt with the question whether humor should or should not be excluded from Bureau reports, we shall endeavor, though perhaps imperfectly, to aid Mr. P. Lawson in our style in his contention that farm life should in every respect be made as attractive as possible. If we fall short of our object it is not because we have no foundation to work upon, but rather because the implement we are most used to handling is the plough and not the pen.

There are a number of conditions under which the farmer works, say in his early or less prosperous times, that it would be peurile on our part to attempt to idealise, and we will let them pass. Also to the early stages of pioneer work the writer wishes his hearers to understand his remarks bear no special reference. Conditions and circumstances, of course, must suggest their applicability. In the case of the pioneer, where a man has had brains and energy enough to successfully overcome the hardships of pioneer life, he invariably has brains enough to make his home attractive when opportunity presents itself.

I wish my remarks more particularly to apply to those whose good fortune it is to enjoy a measure of prosperity, and to those who are living in a reasonable hope of it, providing they have hitherto made the attractiveness of the work, their farms, and their homes a trifling consideration, as in their case it should not be. No lavish expenditure is to be advocated. Only the exercise of a little common sense, a little taste, and the expenditure of very little time and money to bring about the desideratum, namely, the making of the farm more attractive to keep the boy on the farm.

At this point I hope I may be permitted to quote the excellent advice of Mr. F. Robinson, of the Meningie Branch, in reference to the boy on the farm. His opinion might, as Mr. Robinson gracefully anticipates, provoke a sneer from some good old conservatives, but I do not doubt that it will receive such attention from the thoughtful as the good sense of it demands. Mr. Robinson urges that it is to the farmer's own interest, if his son have some

inexpensive hobby, to allow him a little spare time to follow it up. "Surely," he pointedly remarks, "if young Tom works fifteen hours a day part of the year he has a good claim for 'early closing' in the slackier time."

Of course, although the farmer's son or daughter may have an undoubted claim, as Mr. Robinson asserts, to follow up a hobby which does not make any noticeable demand on the common time, we must certainly insist on the force of the fact that too great an indulgence would in this respect be a suicidal policy so far as the farm (the most important consideration) is concerned. In these days of keen competition and low prices every hour the worker loses, especially in the busy and important part of the season, or if the management of a team is entrusted to him, is a distinct loss for which no hobby pure and simple can in any way compensate.

In the matter of labor, however, I think it is desirable that every facility for making the task in hand less laborious and irksome should be appropriated. Where an implement or a contrivance makes the task less arduous, let it be employed. Where a man can ride or rest his legs, there is no necessity to weary them with superfluous muscular exertion. It is because the work is hard, and the pay often not proportionately high, that farmers sometimes experience a difficulty in obtaining hands. Bone and muscle goes where it is better paid.

Regarding holidays, these might well be allowed; of course care should be taken for them to fall during the slack time. A change of scene dispels the monotony of familiar objects and familiar work. The boy or the man that has spent a pleasant holiday sometime during the year copes with the drudgery of fifteen hours toil among heat and flies with a better heart and more contented spirit. The remembrance of a week's enjoyment goes a long way to buoying him up to face any disagreeable work that may fall to his lot and makes it harder for him to be convinced that the sum total of the pleasure and good of city boy's or man's life is in any way higher than that of his own.

The occasional afternoon for cricket or football is pretty generally, though often grudgingly, allowed, and need scarcely be further discussed, as the paragraph on holidays naturally applies to it.

All pleasure, of course, should be taken in moderation. An ordinary well-trained lad, however, will have, we believe, a stern sense of duty regarding the quantity of work he is bound to do, and will not be likely to overstep the mark regarding the quantity of leisure it is his right to expect. He will realise that as a farmer he cannot expect holidays to come often, or last long when they do come. He will understand they are intended to recoup the mind and body to fit them for the more strenuous efforts that should be made to compensate for what has only apparently been lost time.

In the matter of money, we should advocate a system in which a son might receive from his father a percentage of the profits of the work in which he more particularly has to take part. It will add an interest to his work, form in him habits of thrift, and, in addition, give him a business training not without its value in his later life. He should, in most cases, be allowed to dispose of his money as he chooses, although of course a hint or suggestion might be helpful to him. If he has worked for his money, however, confidence in his judgment will seldom be misplaced. The doling out of money seems a bad practice, but of course special dispositions have to be met in a special manner.

As these matters are all relevant to making the farm life attractive, we will again quote some of the excellent advice contained in the article to which, for an earlier quotation, we had to profess our indebtedness:—

"Do not keep your boy always a boy. Let him grow into a man. An old Scotch farmer" (and the Scotch are pretty canny when the bawbees are concerned) "lets his boys go to sales and buy. Sometimes, like their elders, they make mistakes, but they are getting their experience while there is a good adviser with them, and they are growing into men instead of into overgrown boys."

Generally speaking, it is not the fear of hard labor or a false sense of inferiority of calling that is responsible for the drift of the young of the farm cityward. It is often brought about by listening to the remarks of the man to whose interest it is to be the last to mention such a thing, even if it were perfectly true, which it often is not. How often do we hear the farmer himself discrediting his own calling and magnifying that of another. Such remarks as these are common enough in his month: "Look at so-and-so, there in the city; a rosy billet, eight hours a day to work, and doable the pay we poor cockies receive for sixteen hours' work." The unsophisticated youth alongside fails to read between the lines, and some day he sets off expecting to obtain a highly paid sinecure similar to the one of the oft-quoted so-and-so. Sometimes, if he has energy and ability, he will succeed in his new sphere of life; but we have no hesitation in saying that it is our belief that, as far as the great majority of those are concerned who drift cityward, nine out of ten are little, if any, better off than when on the farm, and the State is the loser by exactly their number of producers. Still, of course, an adviser is in a delicate position, for we occasionally see instances where a youth leaves the farm and whose services to the State become equally as valuable as those of the producer.

A great attention to the profitable and enjoyable employment of leisure moments seems to

go a great way towards solving the difficulty. The opinion of Mr. Michael that the brain of the now generally educated young of the farming community finds life dull on the farm is one of great value. Unlike the bovine Hodge of fifty years ago, the brain of the producer of to-day is active or restless. Retrospection of the day's work and the mental gymnastics entailed by a speculation on to-morrow's weather now create no satisfaction during leisure hours. There is a craving for something more. With learning democratised we must meet the producer's need as well as others for the gratification of a taste more or less cultured. The leisure hours of the producer are, of course, mainly those of the evening. Then it behoves heads of households to realise the need of making these attractive. Common sense, kindness, and taste must be pressed into active service if not already there. No great expenditure of money need be made, but in any case the exercise of these qualities is imperatively demanded. Music, books, and social intercourse are admirably adapted to agreeably pass the long or short evenings. Yet towards music, books, and social intercourse how often do we not find some of our good farmers adopting a very boorish attitude. In speaking of books, we are inclined to think as a general rule it would be better to possess a few good books than to depend upon libraries, &c., for reading matter. The reasons for this is obvious. If monetary matters will allow, a few of the better illustrated papers and magazines might also be taken in. By lending these to his less fortunate neighbors a man might extend his sphere of usefulness—a by no means trifling consideration.

The farmer's wife has as good a chance as anyone to minister to the appetites of the family, but we are sorry to say this important matter has in some cases been known to be overlooked. We were struck by the significant title of a short article in the last *Journal*. We thought it would not be a bad plan if it were framed and hung in every badly conducted kitchen farm in the State. "No necessity for hard fare with hard work." The value of fruit and vegetable is pretty generally recognised. But I should like to say a word about ornamental trees and flowers. Certainly the farmer and his sons obtain a certain æsthetic enjoyment from the contemplation of delicate springing blades of wheat, the deep green of the well-grassed paddock, or the waving fields of golden corn, but still more extended will be his enjoyment if his homestead garden be found full of pretty shrubs and flowers. The flowers should not be left, as they very frequently are, in the garden, but they should be made use of indoors. These beautify the humblest room as they grace the grandest. The plainest table is made inviting by a few flowers artifiically disposed. The rudeness of country life, which is so often sneered at, disappears before little acts such as these as clouds do before the wind.

Farmers have already won popular recognition as being a most independent class. Farmers are entirely free from that jealousy and rivalry that squeezes so much gall into the honey of city life. If rivalry does exist it takes the form of healthy emulation.

That the farmer's occupation is a healthy one goes without saying. Where can you find a healthier class than the farmers?

Even he who is possessed with a desire for speculation can find ample opportunity for gratifying his taste. He can indulge his propensity for gambling by gambling in experimental directions. If he does not benefit as far as money matters are concerned, the observant of the general public will undoubtedly profit from the object lessons he is giving them.

We could cite many phases of city life, compared with which our country life would appear to a distinct advantage; but as they are widely known and generally appreciated, it would be superfluous to do so.

We have succeeded in our object if we bring about a spirited discussion or a little thought on this subject of the "Boy on the Farm." He is generally an enlightened creature, and there is no reason that he should not live in an enlightened atmosphere, though possibly gaining only a slender livelihood.

Dr. Stevens, whilst agreeing with most of the ideas expressed, thought it was not altogether the attractions of the cities that caused so many young people to drift in those directions; but, there being no openings for them to get into situations in the country, they naturally drifted towards the centres of population.

Yorke town, September 21.

Present—Messrs. J. Koth (chair), G. Bull, A. Domaschensz, S. Vanstone, J. H. Thomas, and John Davey (Hon. Sec.).

DRY COUNTRY WHEAT.—Mr. A. Jung has sent to Germany for a small quantity of a wheat which is reported to do well in very dry climates.

WHEAT GRUBS.—Mr. Bull said he noticed that the wheat grubs (species of *Melolontha*, or "cockchafer") do not attack the wheat growing on the headlands, and thought this might be due to the soil of the headlands being so packed that the grubs cannot make their way through it.

Scales Bay, September 21.

Present—Messrs. J. E. Dinsdale (chair), J. J. Roberts, E. R. Aitchison, R. G. Thomas, Chas. Nugent, W. J. Thomas, D. P. Thomas (Hon. Sec.), and five visitors.

CO-OPERATION FOR FARMERS.—The Hon. Secretary read a paper, of which the following is the gist :—

Nearly every trade, craft, and manufacture is protected by its union or association ; but the producers (as a body) are not so protected. When they go into the market to buy stores or machinery they have to inquire, “What is the price?” and find that the price has been fixed by the association or union. But when they want to sell their produce they have to ask, “What will you give for it?” The price is fixed by the traders. Perhaps, if the producers were united, they could not command prices that suited them best, but if all the producers of the Federation were joined in one union it would be a very powerful body. Such a union could sell all produce, buy all stores, implements, machinery, &c., charter ships, own mills, factories, warehouses, shops, control trade, act as financiers, avoid middlemen's profits—[and generally act as a close corporation, dispensing with all outsiders except in the character of purchasers of the produce of the union.—GEN. SEC.] But, coming down to present circumstances, much could be done by unity amongst producers in a smaller way. Thus a good stallion could not be purchased under £60 to £100, and very few individuals could afford this ; but if twenty farmers were to club their funds it would cost each no more than £3 to £5 at first, and one farmer could undertake to keep it, whilst the others would pay something each towards the support of the horse, also for insurance, &c. Co-operation could also be applied to purchase of bulls and other stud stock ; also in respect to experimental machinery, fertilisers, etc. Members of the Bureau practically co-operate by communicating to each other, and through the *Journal of Agriculture* to all producers, the results of their experiments. Members were agreed as to the practical utility of the latter part of the paper, and resolved to utilise the idea of co-operation in purchase of stud stock, manures, &c.

Strathalbyn, September 13.

Present—Messrs. M. Rankine (chair), B. Smith, H. B. Butler, W. J. Tucker, A. Rankine, and John Cheriton (Hon. Sec.)

PRACTICE IN ENSILAGE.—In discussing the Hon. Secretary's paper on “Summer Feeding for Cattle on the Plains” some members dissented on the point that fodder should be well trodden on the sides and kept high in the middle, and they contended that the sides should be kept highest as well as being well trodden. Members of other Branches who have had experience are requested to discuss this matter, and report to General Secretary for publication in the *Journal*. [At the same time discuss the whole subject, decide whether or not ensilage is desirable ; and, if so, make preparation for putting down silage at the first opportunity.—GEN. SEC.]

CONGRESS.—The Hon. Secretary read a lengthy report upon the proceedings at the recent Congress of the Agricultural Bureau in Adelaide. Mr. M. Rankine also reported at some length on the same topic. With reference to Mr. Davidson's paper he said—

Mr. Davidson's paper on “Co-operative Dairy Factories and Private Separators” was one on which there was a considerable difference of opinion. Some of the speakers maintained that there should be no conflict between the factory system and the private separator ; that the separator had been of very great importance to the outside districts of the colony ; that the private separator had improved the quality of the butter ; that cream brought from long distances averaged the price of top factory butter. Mr. Thomson, the dairy expert, agreed that the hand separator had been of great benefit in increasing the quantity, but said that it had reduced the quality and that it was impossible to make good butter fit for export from a variety of creams. The Chairman stopped the discussion by calling for another paper, or I should have supported the view taken by Mr. Davidson re private separators within a given radius of a factory, for the reason that this was the subject matter of the paper and that a great part of the speaking had been on the value of the separator to dairymen in outside districts. I was of opinion that the object of the paper was not kept in view by many of the speakers ; consequently the value of co-operative factories was lost sight of, as ascertained from

expert evidence in this and the other States, viz., that first-class butter for export can only be made from milk separated in bulk in a factory by a manager who understands his business. There is also another complaint made against the separator used within a reasonable distance of a co-operative factory, viz., the inability to get a sufficient quantity of milk to make cheese. I must therefore agree with the writer of the paper that private separators are a menace to the spirit and welfare of co-operation as applied to cheese and butter factories.

Cradock, September 28.

Present—Messrs. J. Paterson (chair), P. Gillick, W. H. Haggerty, J. Turner, B. Garnet, W. J. Glasson, A. N. Graham, and J. H. Lindo (Hon. Sec.).

BARBED WIRE.—The Hon. Secretary asked best way to remove barb wire from one fence to another; it destroyed it to drag it over rough ground with a horse. Mr. Haggerty said it should be rolled by hand in large coils; by twisting the coil from side to side while rolling the wire is prevented from springing out at the sides. Other members concurred.

LAND FOR NORTHERN FARMERS.—Discussion took place on the question of obtaining suitable land for the northern farmers. The Hon. Secretary thought there were hundreds of thousands of acres of suitable land that might be purchased by the Government on the same terms as the Yongala Estate. He was acquainted with this land and had reaped 100 acres of the worst of the land in 1876, a very dry year, and it yielded 10 bush. per acre. He believed at the price paid for it the department would be able to offer it at a fair rental. The Pinnaroo land in most cases was offered at 3d. per acre or more, and in view of the doubts as to its suitability for farming operations he thought it would be better to pay more for land such as Yongala. Mr. Gillick was also of opinion that the rent of Pinnaroo lands was too high. There were many farmers who would be compelled to leave the dry districts soon, and the difficulty could only be met by offering suitable land on reasonable terms. A motion expressing approval of the action of the Government in purchasing the Yongala Estate and the hope that more land would be made available was carried. The members also viewed with satisfaction the statement of the Commissioner of Crown lands that preference would be given to farmers from the dry districts in allotting the Yongala land.

Morgan, October 2.

Present—Messrs. E. Jacobs (chair), H. Hahn, J. Bruhn, G. Schell, G. Ruediger, H. Plummer, W. G. F. Plummer, R. F. Heinrich, G. Wittwer, R. Wohling, C. F. W. Pfitzner, and E. French (Hon. Sec.).

CONGRESS.—Mr. W. G. F. Plummer reported on proceedings of recent Congress; also on matters of interest at the Roseworthy College farm. He was much struck with the growth of pasture following the application of fertilisers to the wheat crop, and with the method adopted of making and conserving farmyard manure.

FARMYARD MANURE.—Some discussion ensued on Mr. Plummer's description of the treatment of farmyard manure at Roseworthy. Mr. Rudiger thought every farmer should make pits in which the manure could be stored; if left above ground for any length of time it rapidly lost strength. Mr. Pfitzner said this was a very old practice, though seldom carried out now in this State. His father taught him the value of pits, and always insisted that half the battle towards successful farming was to keep the substance in the farmyard manure.

Nantawarra, September 30.

Present—Messrs. J. W. Dall (chair), R. Uppill, E. J. Herbert, A. F. Herbert, G. Belling, T. Dixon, R. Nicholls, H. J. Spencer (Hon. Sec.), and one visitor.

TRIAL OF IMPLEMENT.—A trial of Traeger's scarifier was held during the month at Mr. Dall's farm, there being forty to fifty persons present.

SHEEP ON FARM.—In the September issue of *Journal of Agriculture*, page 194, it is reported "that the district would generally carry an average of two sheep per acre." This should have read "*two acres* would be necessary per sheep; perhaps a little less now superphosphates are used for the wheat crops."

POTATOES.—Mr. Dall tabled medium size American Rose potatoes; setts were planted late in May, and the land received farmyard manure. The sample was considered very good for this district, but should have been planted earlier.

Rhine Villa, September 28.

Present—Messrs. H. Michan (chair), W. Start, T. Edson, H. Payne, and J. Vigar (Hon. Sec.).

FORESTS AND RAINFALL.—Mr. J. Vigar referred to some opinions expressed by a member of Brinkworth Branch that forests do not exert any influence upon rainfall, and said he thought there was abundant scientific evidence that disastrous effects follow the denudation of timbered country. Mr. Edson thought that mallee forests had very little effect on the atmosphere, but that it is advisable to leave belts to serve as windbreaks.

BEETLE PEST.—Mr. Edson tabled some beetles which he said were very destructive in his garden. [These prove to be *Tenebrio obscurans*, specimens of which have been often sent down charged with a similar offence, but Mr. Tepper says they live only on decayed roots, &c.—GEN. SEC.]

Wandearah, October 2.

Present—Messrs. Geo. Robertson (chair), L. Stanley, E. H. Eagle, W. Roberts, W. J. Fuller, E. Jacobs, W. Munday, and C. E. Birks (Hon. Sec.).

RABBIT DESTRUCTION.—Considerable discussion took place on this subject. Members were of the opinion that it was dangerous to cattle eating the bones of rabbits destroyed by phosphorus poisoning. It was considered that the carbon bisulphide method was too expensive owing to the uncertainty of the size of the burrows and whether they contained rabbits or not. The members agreed to use every means practicable in destroying the pest. The Hon. Secretary read Mr. Kahlbaum's paper on "Stray Notes on Wheat," which appeared in the September issue of the *Journal*.

Quorn, September 26.

Present—Messrs. R. Thompson (chair), J. B. Rowe, F. Herde, C. Patten, Jas. Cook, W. Toll, and A. F. Noll (Hon. Sec.).

HORSE COMPLAINTS.—Port Germein Branch wrote inquiring *re* treatment for disease in horses reported to have been prevalent in Quorn district, but members were not aware of the existence of any such disease.

CONGRESS.—Mr. Rowe reported on proceedings of recent Annual Congress in Adelaide, and also on matters of interest connected with visit to Roseworthy College farm.

ANNUAL REPORT.—The Hon. Secretary's annual report showed that during the year seven meetings had been held with an average attendance of eight members, there being eleven on the roll. Five papers had been read, and many items of practical interest discussed. A successful Conference of the Far Northern Branches was held in February. The retiring officers were thanked and re-elected.

Amyton, October 3.

Present—Messrs. Jos Gum (chair), Alex. Gray, Wm. Gum, H. Gray, Thos. Gum, Wm. Mills, S. Thomas, Wm. Hughes, Jno. Kelly, H. B. Turner (Hon. Sec.), and two visitors.

CONGRESS.—The delegates gave an interesting report on their attendance at the Congress in Adelaide.

FARMYARD MANURE.—A member asked whether the ashes of burnt farmyard manure contained the same fertilising constituents as the original manure. [When farmyard manure is burnt the nitrogen contained is driven off, the phosphoric acid is converted into a soluble form of phosphate of lime, while the potash remains unchanged. It would not pay to apply farmyard manure in this way to grain crops, as it contains no organic matter nor moisture, and the bulk of the manure is very considerably reduced. It would certainly have the effect of destroying seeds of weeds.—GEN. SEC.]

Port Broughton, September 23.

Present—Messrs. W. R. Whittaker (chair), W. Tonkin, E. Dalby, E. Gardner, E. Dennis, H. A. Dolling, J. H. Harford, W. Dalby, and Jas. Barclay (Hon. Sec.).

FOREST TREES.—Members decided to permanently advocate the extensive planting of belts of forest trees throughout the State.

CONGRESS.—Messrs. Whittaker and W. Tonkin reported on visits to Congress and to the Roseworthy Agricultural College. The knowledge gained and the information given at these functions amply repays all the time and money spent on them.

Arden Vale, September 30.

Present—Messrs. E. H. Warren (chair), M. Eckert, C. Pearce, G. Williss, A. W. Fricker, G. Miller, P. Starr, J. H. Williss, and A. Hannemann (Hon. Sec.).

EXPENDITURES.—Since formation the members have subscribed liberally to found prizes for best kept farms, gardens, collections of products, industries, etc., and other objects.

FARMING IN THE NORTH.—Mr. A. W. Fricker read a paper to the following effect :—

There are portions of the North to the northward of Goyder's rainfall line which are not subject to constant and complete failure; but there are other parts where no system of farming will ever make them productive, and the sooner that land is returned to grazing purposes the better for all concerned. Where failures are not constant, it is shown that the land that has been fallowed gives much better returns than that which has been cropped on the stubbles, the difference being as between 3bush. to 4bush. per acre on the latter, and 20bush. per acre on the former. The fields are getting dirty, and considerably more cultivation is now

necessary than formerly to keep them in check. To attempt to grow wheat crops now on any but fallowed land will not pay. Good farming only will obtain the maximum returns, and most farmers in this locality are using fallowed land only for cropping, and if the season proves favorable—as is sometimes the case—the returns recoup for the partial failures of the previous years. Phosphatic manures should pay for use on the limestone soils, but are not at present required on the timber lands. The greatest losses to farmers in this locality have been in regard to live stock, and it is imperative that large reserves of fodder should be made. All wheat chaff should be put under shelter from wet. It is not possible to save enough of hay to tide the stock over the periods of drought. Header straw will support horses, and they work well on it if a little good hay and some wheat husks are added. As the fallowed crops usually produce a good lot of straw, a quantity of that should be stacked every year, with a certainty that in time it will be all wanted when drought occurs. Many farmers have most of the machinery and implements they require, but something might be done by co-operation where farms are small and certain machinery too costly for one to acquire.

The Chairman said if it were possible he would crop nothing but fallowed land, but that required a lot of strength and a very early start. Late fallowing is by no means to be recommended except when good rains have preceded. He placed much reliance upon the use of superphosphate. Mr. Eckert has obtained heavy crops from fallowed land and very poor crops from stubble lands. Fallows should be well worked with the harrows and scarifier. Mr. Willis had found it best to take off two successive crops, and then lay up in fallow, on account of the uncertainty of the seasons and the richness of the land. Mr. Pearce would crop one year, rest it the next, and fallow the third year. Manuring will result in better crops than at present, and will be better for the pasturing of stock.

SORE SHOULDERS.—Mr. Miller has used the following successfully for the cure of sore shoulders on horses:—Half a pint each of strong vinegar, neats-foot oil, and turpentine, mixed with the white of an egg. Apply as often as convenient.

HARVEST MEETING.—Decided to hold the annual harvest meeting on November 25, 1901, with a show of farm products, flowers, fancywork, and home industries.

Burra, September 20.

Present—Messrs. F. A. S. Field (chair), F. Goodridge, F. G. Dawson, A. McDonald, W. Heinrich, James Scott, W. G. Hawkes, and R. M. Harvey (Hon. Sec.).

REPORT ON CONGRESS.—Chairman said he had attended some of the meetings of the Agricultural Bureau Congress in Adelaide. He had also visited the Agricultural College, where Professor Lowrie had given the numerous visitors a lot of valuable information about the demonstrative and the experimental work that was being carried on. The improvement in pasturage there through the use of super. and other fertilisers was very noticeable. Although heavily stocked there was abundance of feed. Purple Straw and King's Early appeared to be the best wheat crops; but he thought King's Early better suited for hay than for grain, as the seed is very dark. He believed this wheat would suit the mallee country. Mr. E. Goodridge, who was also one of the delegates, read a lengthy report, in which the following remarks appeared:—

The second day was rather lively, owing to the discussion which arose from the reading of a paper on "Co-operative Factories and Private Separators." Discussion is useful in bringing out all the weak points as well as the strong ones on both sides of the question. But sometimes the perceptive faculties of the disputants become clouded through the elevation of the mental temperature; unwarranted advances are the result. The factory adherents seem to opine that good butter of even quality can only be made at a factory, and, although I fail to agree with them on this point, I do certainly agree with them in saying that where a reliable factory exists it is only reasonable to expect that every dairyfarmer within a fair distance

will patronise it. The reason why is obvious and patent to all. Under such conditions we all ought to merge our individuality and heartily co-operate for the common weal. But in many cases cows are kept far away from any factory, and the hand separator is a first necessity, and I have yet to learn that the factory can produce better butter than can be made on a farm where there is a hand separator. Where properly managed the normal conditions are certainly in favor of the separator on the farm. The milk is separated as soon as drawn from the cow, the cream at once cooled, and each day's cream churned by itself as it ripened. At a factory the milk is brought from all quarters near and far under various conditions and circumstances—some good, some otherwise—the milk is separated, and the cream made into butter. For what reason, then, are we to suppose that factory butter is superior to butter made on the farm under the conditions above described?

“OVERSTOCKING PASTURE LANDS.”—Mr. F. G. Dawson read the following paper:—

The most capable managers are likely to experience difficulty in keeping their live stock in good condition during times of drought, even if they are so fortunate as to be able to keep the animals from starving to death. As a general rule, however, he who in time of plenty considers the possibility of hard times, and prepares accordingly, reaps a reward for his forethought.

It is a common mistake to overrate the carrying capacity of land; it is also very expensive. Not only is there a certain loss in value of stock that are kept short of feed, but the land is rendered less valuable by excessively heavy stocking. The more a man makes his pasture land support beyond a reasonable limit, the less it will be able to produce in succeeding years. Not only do the best grasses get eaten out by continuous close feeding, but the absence of earth's natural covering allows the rain to run off too freely, carrying with it a certain amount of fertile surface and a great deal more manure than would usually be swept off well-grassed land. Then, too, in summer the wind carries away rather much of the best soil if it has been left too bare.

Apart from the deterioration of land, however, it pays to stock lightly, or comparatively so, for the extra condition of well-fed animals will more than compensate for the greater supply of feed allowed to each. If there is a good deal of dry grass left from one season it is splendid shelter for the young plants for the following winter, thus fostering a more vigorous growth during cold weather. It is also beneficial to cattle when the young grass is tender and watery, and prevents scouring. Again, if a season of drought appears the cautious policy of understocking for good seasons will probably be the means of saving a number of animals from starvation.

If we take a block of land just suited to carry 500 sheep in good order from one shearing to another, and, instead of stocking only 500, put 600 or 700 on it, they would yield very little if any more wool than the 500 well-fed sheep would have done; nor will the wool be worth so much per pound. It is also questionable whether the greater number will be of as much value when shorn as would the 500 well-fed animals.

Now, I come to a point where I take a decidedly different view from some herdsmen and flockowners, many of whom consider that extreme poverty does not impair an animal's qualifications for breeding, providing it be in what is termed “good condition” at the time of giving birth to its young. I believe, however, that as an animal kept in extreme poverty for any length of time in early life will never attain the same size or strength as one well nourished from the day it is born, so the offspring of the starveling will be liable to inherit a weaker constitution on account of its parent's lack of vigor. It may not be apparent in one generation as a general rule; but it should be borne in mind that there is a tendency to transmit an acquired weakness, although it may not be commonly noticeable until established by successive generations. The foundation of successful breeding must be constitution, and that cannot be built up or maintained by starvation. We want hardy animals, not only in order that they may endure hardship if it becomes unavoidable, but that they may take every advantage of more favorable conditions. If we want to breed strong, vigorous animals we should, as far as possible, keep all stock intended for breeding purposes well nourished while they are of a growing age, although of course pampering should be avoided.

To sum up, there are many advantages to recommend lighter stocking of pasture land than is frequently practised, and not much to be proved in favor of keeping more animals than the land is fit to support.

Morphet Vale, October 7.

Present—Messrs. H. Smith (chair), R. Binney, A. Pocock, F. Pocock, G. Goldsmith, E. Perry, J. Bain, J. McLeod, and A. Ross Reid (Hon. Sec.).

OXALIS CERNUA.—The Chairman recommended experiments with a solution of 1lb. of bluestone in 10galls. of water for destruction of soursops. If applied several times he thought it would kill the bulbs. [Would it not also kill all other plants?—GEN. SEC.]

KENTROPHYLLUM LANATUM.—The Hon. Secretary expressed his strong conviction that crossbred sheep would do well on land infested with the Barnaby thistle, which is sometimes called "common star thistle" in the South-east. [It is well known that crossbred sheep will eat Barnaby thistle (and even stink-wort when hard pushed), but the plant is an objectionable weed, and very few farmers desire to have it overrunning their paddocks.—GEN. SEC.]

BROADCAST *versus* DRILLED MANURES.—Mr. Bain said he thought the crops were cleaner this year where the manures were broadcasted than where they were drilled. Mr. Smith thought if such were the case the manure in the drills had favored the weeds; but on the whole he thought the drilled crops were the cleanest, as the wheat had got ahead of the weeds.

SORGHUMS.—Some members do not agree with the statement that as good a crop of wheat will be obtained after a crop of sorghum has been grown on land that has been laid up fallow as would be secured had the same land been left in bare fallow; and that this theory is contrary to their experience, even with a good rainfall. Mr. Smith said the great object of fallowing is the conservation of moisture in the soil, and by growing a crop of sorghum that object is defeated. [Several farmers, who claim to have tested the matter, have asserted that when the autumn is favored with a little rain, the following wheat crop is better on the fallowed land than the adjacent land that was bare fallowed; but when the autumn has been rainless there was a poorer crop where the sorghum had been grown.—GEN. SEC.]

Johnsburg, September 28.

Present—Messrs. G. H. Dunn (chair), H. Napper, F. W. Hombsch, M. L. Read, P. Caughlan, W. Buchanan, J. R. Masters, T. Potter, J. Read, L. Chalmers, F. W. Smith, W. McRitchie, T. Johnson (Hon. Sec.), and one visitor.

CONGRESS.—Delegates gave an interesting account of proceedings at the Annual Congress of the Bureau, and of their visit to the Export Produce Freezing Works and to the Roseworthy Agricultural College. They were struck with the utility of the continuous hay-baling press at the college, and its value in baling straw for building walls of sheds, &c., which walls could be utilised in the North during famine seasons for feeding farm stock. Delegates were especially pleased with the papers by Mr. D. F. Laurie on Poultry for Farmers, and by the Dairy Instructor (Mr. G. S. Thomson).

EXHIBITS.—By Mr. McRitchie, one Daniel's Defiance cabbage, weight 16lbs., grown by himself, planted March 8, and had three waterings only; also Long Yellow carrots, very large, grown from seed supplied by Central Bureau

"HOW TO MAKE FARM LIFE ATTRACTIVE."—Mr. F. W. Hombsch read a paper to the following effect:—

He would not attempt to combat the reasons advanced for the alleged strong feeling of dislike exhibited by many young people against farm life and farm work. It would be admitted that a well-regulated farm could be worked with less trouble, labor, and expense than some farms that are badly managed. A well-managed farm would have its dwelling-house and outbuildings or steading as near the centre of the holding as would be most convenient—not in a corner; but the locality should be selected with due reference to the water supply. This would save much time in going to work on the various parts of the farm. It should be on rising ground—not in a watercourse. The selection should be divided into convenient blocks, and dairying should be a part of the work on every farm. The natural grasses should be preserved. To do this, a thousand-acre block should have 400 acres reserved, and the other part should be divided into three equal paddocks of 200 acres, one of which blocks should always be fallowed each year, and the other two be cropped—by this two crops would be raised in succession off part of the land—100 acres that had been cropped last year also, and 100 acres that had been fallowed. All fences should be secure, especially those on the boundaries. Provide shelter for stock and machinery as well as for the family. The flood waters of winter

should be diverted on to the garden, so as to give the land a thorough soaking and ensure good crops of vegetables and fruit, all of which will be much fresher and nicer than any that has been hawked or brought from a distance. Sugargums or other suitable trees should be planted around the homestead for shelter and to make the place look pleasant. Four or five acres should be enclosed with wire netting for the poultry, which should not be allowed to run at large. Farmers are not always able to pay regular wages to their children, but they ought to have some pecuniary interest in the farm when they are able to take a part in the working of it. The income from an acre or two of the wheat, or an interest in the produce from the poultry, cows, or other live stock would hardly be missed, but it would give the young folks an active interest in the well-doing of the farm. It is not sufficient to try to inspire them with the hope of a "start in life" when they are old enough. Who knows whether that time will ever come, or whether the old folks will be able or willing to give them the "start" when the youngsters think the proper time has arrived? Anyhow, "a bird in hand is worth two in the bush," and the "sweet by-and-by" is hidden in the distant clouds of the future when regarded from the youthful standpoint. Naturally, in many cases, they discount the future in favor of the present, and they seek employment in the towns and city, where the labor is often lighter, the hours shorter, and the pay regular. They cannot see the restraint that will be placed upon their freedom, the unhealthiness that usually attaches to the confined atmosphere, and often sedentary nature of the city life, nor do they take any account of the innumerable advantages of a life in the free air of the country.

Tanunda, September 26.

Present—Messrs. J. H. Walden (chair), T. Sage, P. Trimmer, G. Mann, J. Gurr, F. W. Gratz, W. Liddiard, W. Grocke, C. F. W. Lehmann, and C. Heineman (Hon. Sec.).

BUSINESS.—Several members promised to read papers, and it was resolved to try and make the Branch practical and progressive, if possible.

CRUSHED OATS FOR HORSES.—Some members prefer whole oats for young horses and crushed for older horses, and the majority would prefer whole oats for horses that are being worked. New Zealand oats are preferred.

STRANGLES, &c.—After a long discussion on this subject the consensus of opinion was that steam from boiling barley, or with eucalyptus, carbolic acid, or old honeycomb in the water will be beneficial in the early stages. One member preferred the darkest old honeycomb after the first treatment. The horses like the sweet odor, and want no coaxing, and the treatment nearly always has the desired effect. If there are any tumors, lance them and allow the contents to escape. Fumigate and disinfect the stable. For lampas it is recommended to rub the swellings with salt, and to lance them if necessary. Greasy heels must be well cleaned, dust with alum and sugar of lead, or alum and bluestone, and thoroughly cleanse the floor of the stable and keep it dry and clean.

Murray Bridge, September 27.

Present—Messrs. R. Edwards (chair), B. Jaensch, W. Wundersitz, G. A. Kutzer, J. Stocker, W. Schubert, H. Schubert, W. G. Hannaford, W. Lehmann (Hon. Sec.), and one visitor.

BUSINESS.—Hon. Secretary tabled a list of subjects to be discussed at future meetings, which was adopted.

POULTRY.—Hon. Secretary read articles by Mr. D. F. Laurie and Mr. Wylie on poultry-keeping from the *Agricultural Journal*, which were considered to be the best reports yet printed. Members have concluded that poultry pay fairly well if good laying varieties are kept. They consider that table fowls should be sold only by weight, as this practice would tend to reward the careful breeder for his trouble in rearing large birds of good quality. The Hon. Secretary said it behoves farmers to utilise every source of income from their holdings;

and from the careful statement of expenditure on and income from his poultry published by Mr. Wyllie, as well as the statement made by Mr. Laurie, it was evident that there is profit to be made if the business is carefully managed. The poultry on a farm would take up the best part of one person's time. Diseases and losses amongst fowls can be minimised, if not altogether prevented, by proper housing, cleanliness, and feeding, together with scrupulous attention to details. It will never pay to let fowls run anyhow, to roost on the vehicles, machinery, &c., or to haunt the feeding-troughs and mangers, defiling the horses' feed, scratching thatch off the stacks, filling the stables and cowsheds with vermin and the like.

CRIPPLED COLT.—Mr. Wundersitz said a young colt belonging to himself could only walk on the first joint over the fetlock, the feet sticking out in front. Some members had seen similar deformities, but the foals in every instance recovered the proper use of their legs in time.

Port Germein, September 28.

Present—Messrs. G. Stone (chair), E. G. Blessing, A. Thomson, C. O'Loughlin, H. Kingcombe, J. R. Gluyas, W. Head, J. K. Deer, and A. H. Thomas (Hon. Sec.).

CONGRESS.—The Chairman and Hon. Secretary reported on their attendance at the Annual Congress. Chairman advised all who could do so to attend these functions, as both papers and discussions were very beneficial.

LEAD-POISONING.—Members consider that the diagnosis by the Chief Inspector of Stock of the cause of deaths of horses around Port Pirie is correct.

DAIRYING.—Some members differ from the Dairy Instructor on some points mentioned in his paper, but details will be given at a future meeting.

Wilson, September 30.

Present—Messrs. W. H. Neal (chair), J. Nelson, T. Barnes, H. Need (Hon. Sec.), and four visitors.

COST OF PUTTING IN WHEAT.—Members decided that it will cost 7s. to put in an acre of wheat in the district.

LOCUSTS.—Members agreed to experiment with the arsenic, sugar, and other substances mentioned in *Journal of Agriculture* for November, 1899, for destruction of locusts. Mr. Robinson stated that he had cleared 700 acres of locusts in ten days at a cost of 7s. per day.

Stockport, October 5.

Present—Messrs. J. Smith (chair), C. W. Smith, J. Smith, jun., T. Megaw, T. Howard, A. Branson, D. G. Stribling, J. F. Godfree, and J. Murray (Hon. Sec.).

FARM BUILDINGS.—Mr. Stribling read the following paper:—

In selecting a site and laying out a farmyard great mistakes are often made, and one of the most common of which is in selecting a low-lying position where the yard is overflowed by flood waters. Select an elevated position, and be careful not to place the dwelling-house in the lowest position in the yard, with all the farm buildings on the higher portion, so that all the drainage from the stockyards, stables, and pigsties run down about the back door.

In laying out your farmyard three principles at least should always be observed, viz., comfort, convenience, and appearance. The two former should be strictly observed; the latter, though not so necessary, will add greatly to the beauty of your homestead.

The first and chief building in the yard is the farmer's residence. This should be placed on the highest position, overlooking all the other farm buildings, and the first to be seen by anyone approaching the place. Be careful when building to have your house placed in the right position, because when once built it cannot be moved to suit your taste. For comfort and for health sake your house should be placed in such a position as will ensure as much fresh air and sunlight as is possible, as these are necessary to health and comfort. Bedrooms should be situated so that a good stream of sunlight can be poured into them, in the winter months especially. Doctors tell us that a family can be scarcely expected to grow up healthy and strong where these rules are not observed. A good verandah will add greatly to the comfort and appearance of your house, besides preserving your buildings and sparing you the expense of continual painting and every few years new doors and windows.

The barn for the storage of the farmer's produce is a very necessary building, and no farm homestead is complete without it. In sparing the expense of building a barn many a farmer in days gone by has lost over and over again the price of the building in damaged wheat and in paying storage to the millers and merchants. The barn needs to be built on rising ground some little distance from sheds and haystacks, so as to be as free as possible from the danger of fire. Stone walls with iron roof makes the most substantial and durable building. The principal drawback is the weevil pest, which, if once properly settled in the wall, is very difficult to clear them. Galvanized iron is by far the best, as the weevil can find no shelter, and if they should get into the wheat stack they can never live in the building after the wheat is removed. An elevated floor to the height of the bottom of the wagon is a great convenience, and will save a lot of heavy lifting and carrying, as the wheat can be wheeled to and from the wagon. These little conveniences are a great saving of labor, especially on small farms, where the farmer most part of the year is single-handed.

One of the most important buildings on the farm is the stable for the horses. In the early days straw sheds were the general stable on most farms, and have served their purpose well; but these buildings, though quickly and cheaply erected, are not durable, and in the course of years will decay, and if not attended to will soon fall about the horses' ears. Then, if the farmer is in a position to face the expense, a substantial building of stone walls and iron roof is the best stable to erect, the strongest objection being the heat of the iron during the summer months. This can be overcome to an extent by the use of paint or Jack frost. Flag the bottom of the manger to keep it clean and durable. The bottom should be raised at least 8 in. or 9 in. A broad passage behind the manger is a great convenience for feeding the horses. The back of the manger will need to be about 4 ft. high, to prevent the horses rooting the hay out and reaching over after the hay behind the manger. Where the stable has been built without a passage, a room at the back to put the hay in will be found convenient, will keep the hay dry, and prevent it blowing about on windy nights. I strongly advocate a closed-in stable with plenty of ventilation. The iron can be put 4 in. to 6 in. above the walls, which will cause draught. Broad doorways, with double doors, leaving the top half open, will keep the stable cool, and can be closed on cold wintry nights. A large underground tank near the stable will be found of great benefit where water is scarce, and will keep the stable clean and dry.

Sheds are very necessary for the protection of the implements. Broad wings to the sides of the barn make excellent implement sheds, and easily erected with but the cost of the iron and a little timber. Farm implements are a very great item to the farmer, and a pound saved on implements by taking care of them is equal to a pound spent on them in the way of repairs.

Cattle sheds, fowlhouses, and pigsties are all very necessary buildings. Pigsties need to be paved or flagged, otherwise they can never be kept clean.

Give the necessary care and attention to the farm buildings when they are erected and they will last a long time, and will add greatly to comfort and convenience. If you are a dairyman be careful over the cleanliness of the cattle sheds, and especially the milking sheds, as it is a very important point. Government inspection of dairy premises is already being urged in some quarters. In the dairy it is necessary to be particular in this respect. Dairying can never be carried on successfully unless you have a suitable place for the care and storage of your produce, and in these times, when for the most part of the year farm produce is very cheap, it becomes the farmer to have conveniences to make the best use and the most profit of every line of his income.

Mr. Godfree preferred stables open to the east or north, and advocated iron barns on account of weevils. He had even seen weevils in iron barns, but not so bad as in those with stone walls. Mr. C. W. Smith agreed with the paper, but a beginner had not always the capital to enable him to follow all the advice therein. Had used closed stables until last year, when he built one open to east, and is satisfied it is best for horses in either summer or winter. He thought it would be an advantage to have a garden, so that it will take the drainage from the stables, &c. To clear out weevils he would build a single

wall of wheat in bags all round inside the barn; the weevils would get into that wheat, which should then be carted away before bringing in any more wheat. Mr. Megaw would cover the open side of the stable with wire net to keep out the fowls. Mr. Branson proposed thatch for stables, as iron is too hot.

FIELD POPPY.—Mr. Stribling tabled a new weed, which no member was acquainted with. [This is *Papaver rhœas*, or field poppy, which is spreading over the whole of our wheat fields.—**GEN. SEC.**]

Carrieton, October 3.

Present—Messrs. W. J. Gleeson (chair), W. Steinke, A. Steinke, J. W. Cogan, F. Vater, F. Kaerger, G. Martin, R. Fuller, M. Manning, H. Menz, and J. W. Bock (Hon. Sec.).

WELLS, &c.—Mr. Vater read a short paper on water supply for farms. Amongst other sources he mentioned wells. He considered a well of good water to be the most valuable improvement that could be made. It saves no end of work in carting water, and a supply can be raised whenever leisure allows. He considered a good well enhanced the value of the farm by £100. In discussion members considered this greatly under-estimated; the value of the well would be three or four times greater. In parts of this district the ground is too porous to allow of the use of reservoirs and dams, and resort must be made to cemented tanks and similar devices.

Koolunga, September 26.

Present—Messrs. T. B. Butcher (chair), J. Button, E. J. Shipway, R. H. Palmer, Geo. Jose, T. Freeman, J. Sandow, J. Butterfield, G. Cooper, R. Lawry, J. C. Noack (Hon. Sec.), and one visitor.

CONGRESS.—In reporting upon attendance at Congress in company with Mr. Palmer, Mr. Button mentioned his visit to the Agricultural College. The difference was remarkable between the manured and unmanured plots. The cattle, sheep, pigs, and poultry on the farm were well worthy of inspection; but the implements were no better than those kept on an ordinary farm. [Every farm should be equipped with the most useful and substantial machinery and implements procurable. There are very few farms on which a continuous hay-baling press is to be found, but there is one that is well worthy of attention at the Roseworthy Farm.—**GEN. SEC.**]

FUTURE BUSINESS.—In the event of no paper being promised the Chairman was authorised to call upon any member to be responsible for the business of following meeting.

Arthurton, September 27.

PRESENT—Messrs. W. H. Hawke (chair), J. B. Rowe, J. Koch, W. Short, T. B. Wicks, S. T. Lamshed, J. Welch, W. E. Hawke, and C. L. Palm (Hon. Sec.).

CONGRESS—Messrs. W. E. Hawke and W. Short reported on proceedings of Congress, referring specially to Professor Lowrie's address.

LAMPAS.—Discussion took place on burning lampas in young horses. Mr. Rowe had used salt and alum, but failing success with these, searing was his only other method. [Lancing, followed by use of soft food for a time, is always recommended by competent authorities, but searing is utterly condemned by them.—**GEN. SEC.**]

FEEDING DOWN EARLY WHEATS.—The suggestion of the General Secretary to sow early wheats early and feed down with sheep did not meet with approval except on new land.

ALTERATION OF SEASONS.—The Chairman took exception to the General Secretary's statement that owing to the destruction of timber our seasons had altered, and were later than formerly. His experience was that wheat seemed to ripen quite two weeks earlier than it did years ago, and in the fruit gardens he noticed the same thing in respect to earlier ripening of fruits.

Richman's Creek, September 30.

Present—Messrs. W. Freebairn (chair), A. Knauerhase, J. M. Kelly, E. Roberts, A. Nicholson, M. Hender, P. J. O'Donohue, W. J. Wright, F. Mattner, and J. McColl (Hon. Sec.).

CONGRESS AND SHOW.—Delegates reported on proceedings of Congress and visits to the Show, the Agricultural College, and the Produce Depot. Mr. Knauerhase referred to the Congress, many of the subjects dealt with being particularly interesting. M. McColl spoke of his visit to Roseworthy. The crops were in his opinion much later and not so promising as at the time of last year's inspection. The advantages of the use of fertilisers on the succeeding pasture was particularly noticed at the College; land that was under crop last year carries a ewe and lamb to the acre. The dairy herd was commended; the cows and heifers showed a strong strain of Jersey breed, but were of a larger type than the pure bred Jersey. At the show the machinery came in naturally for most attention, the complete harvester being of special interest. He would like to see these machines at work in a standing crop before expressing any definite opinion about them.

Colton, October 5.

Present—Messrs. P. P. Kenny, E. Whitehead, M. S. Kenny, John McCracken, W. P. Parker, W. A. Barnes, John Whitehead, and R. Hull (Hon. Sec.).

CASTRATING COLTS.—In discussing this question the Chairman said he had twenty-one operated on at various times—some during May, and others when there was plenty of green feed about. Those done early in the season—May—did better than those treated whilst in good condition. Mr. Whitehead said that colts that were dry fed get over the operation better than those that are on good green feed. Mr. Barnes said young horses in poor condition are easier to break in than those that are in good condition.

FERTILISERS.—The Hon. Secretary read a paper "Are Commercial Fertilisers Always a Success," in which he submitted the question for consideration by all Branches whether it is possible to continue the use of any one fertiliser exclusively to all others without exhausting the producing power of the soil. He had a seven-acre paddock under cropping for four years. The first year he put no manure on it; next year he broadcasted 3cwt. Thomas phosphate on it, and there was apparently no beneficial result; next year he drilled about six acres of it with Chemical Works super. with very poor results, nearly all take-all and root-fail, and some never came into ear. For this reason he used 6cwt. Adelaide Chemical Works super., with similar results so far as he could see. He would like to know the reason. The analyses of super. gave 36 to 38 per cent. soluble phosphate, and he wished to know what the other

64 to 68 per cent. consists of. Is it possible that the acids used contain sufficient arsenic to injure plants. [There is not the slightest possibility of arsenic being contained in the sulphuric acid to cause any injury to plants; if there had been a possibility the plants would have been killed at once, and would not have lasted a week after coming through the soil. The 64 to 68 per cent. not water-soluble in super. consists of lime and sulphur combination (with a small quantity of other matters) removed from the previously insoluble bone or rock by the action of the sulphuric acid. That 64 to 68 per cent. of the super. is insoluble in water.—GEN. SEC.]

Brinkworth, October 11.

Present—Messrs. A. L. McEwin (chair), J. Cross, J. F. Everest, W. H. Shepherd, and J. Stott (Hon. Sec.).

PROLIFIC EWES.—Chairman mentioned that Mr. Manglesdorf, near Blyth, has four pet ewes from which he cut an average fleece of 20lbs. each, and that two of them each had two lambs each twice within twelve months.

RAINFALL.—At Condowie, for year to date, 8'31in. Mr. Freebairn reported that in 1881 the fall was 7'94in.; in 1882, 6'48in.; in 1885, 7'71in.; in 1891, 7'86in. At Brinkworth to October 12, 1'2in.; for year to date, 9'98in.

Kapunda, October 5.

Present—Messrs. W. M. Shannon (chair), W. Flavel, J. O'Dea, Pat. Kerin, J. J. O'Sullivan, G. Teagle, T. Scott, J. H. Pascoe, B. R. Banyer, and G. Harris (Hon. Sec.).

SPARROWS.—Mr. Teagle read a paper upon the sparrow pest, to the following effect:—

This question has agitated the public mind for years past, and the time cannot be far distant when the Government should be asked to contribute to the protection of farmers' and fruit-growers' crops, "as it has been entirely due to the error of the Government in allowing such birds as sparrows and starlings to be imported and turned at large in South Australia." From examination of the crops of 694 sparrows by twelve careful inquirers in England it was found that the customary food was grain and other seeds all the year round. Mr. Gurney says in his report that 75 per cent. of a sparrow's food during life is grain of some kind. Dr. Edwards placed the stomachs of 100 sparrows before the British Association, and not 6 per cent. of insect food was found in them. Colonel Russell, after fifteen years' research, concluded that the sparrow is a useless bird. One pair of sparrows produce as many as twenty young during twelve months, and if no disasters overtook them there would quickly be millions of descendants. Stockport District Council paid £14 last year for sparrow destruction. If all district councils and municipalities acted in a similar way there would be a great decrease in the numbers of sparrows. Agricultural societies should also offer prizes for collections of sparrows' heads and eggs, and a subsidy should be sought from the Government. It is estimated that one-fourth of the grain crops is destroyed by sparrows and starlings, but, reducing it to one-quarter of an acre in each 100 acres cropped, would amount to 3,935½ acres out of the 1,574,017 acres reaped. The average yield last year was 7½ bush. per acre, so that a loss of 28,528½ bush. of wheat was sustained, which, at 2s. 6d. per bushel, represents a loss to the State of £3,566 2s. 2½d. But if the estimate that this is only one-fourth of the total loss sustained is correct, then the loss is very much greater. The vinegrowers complain bitterly of the damages inflicted by the sparrows and other introduced birds, and if all the losses were totalled the sum total would seem to be appalling.

Mr. O'Sullivan said thatched roofs and acacia hedges afford much harbor for sparrows, and if these were done away with the pest would be diminished. He thought farmers and gardeners ought to do more to protect themselves against the birds, and not to look to district councils, corporations, and the Government to take the matter in hand. Mr. Teagle blamed the Government for allowing the importation of the birds. Hundreds of thousands of pounds worth of damage was done by them every year. [Some of us can remember the time

when the Acclimatisation Society and private individuals also were greatly praised for their "enterprise and public spirit" in introducing various birds and animals.—GEN. SEC.] Mr. O'Dea thought united action would do much to remedy the evil, as was the case with rabbits a few years ago, although the sparrow is more difficult to deal with. Acacia hedges ought to be destroyed, even if it had to be done by Act of Parliament. Mr. Flavel thought it would not be possible to cope with the pest whilst the birds were allowed to breed unmolested in Government buildings. Mr. O'Sullivan thought the most effectual way to deal with them would be for the councils to provide poisoned wheat during winter, when there is but little food about. At harvest time the birds could find abundance of grain, and would not touch poisoned wheat. He did not agree that the Government should be called upon for assistance. He found it a protection to his crops to cut a chain or two in width for hay. The sparrows would not go into the fields, but kept around the borders. Mr. Teagle did not think the people would destroy the sparrows unless compelled by law. It was almost impossible for farmers to keep them down, because the birds were allowed to breed in the towns.

Cherry Gardens, October 3.

Present—Messrs. C. Lewis (chair), J. Lewis, A. Broadbent, W. B. Burpee, G. Brumby, G. Hicks, T. Jacobs, and C. Ricks (Hon. Sec.).

ALMONDS.—Question raised as to whether almond nuts will produce trees bearing almonds of a similar nature. [No; each nut will probably develop a tree bearing almonds distinct from the rest, such as bitter, sweet, hard, soft, thin shells, thick shells, &c. The variety required must be budded or grafted on to the seedling stock.—GEN. SEC.]

Mundoora, September 27.

Present—Messrs. J. J. Vanstone (chair), W. Mitchell, W. J. Shearer, H. Haines, W. Aitchison, and A. E. Gardiner (Hon. Sec.).

WHITEHEADS IN WHEAT.—Mr. Aitchison called attention to the great number of whiteheads now apparent in the wheat crops. He thinks this may be due to some insect attack. Members would be grateful to anyone who can tell what is the cause, and the remedy if one is possible. [It is possible that very hot dry weather may have occurred at the time when the wheat was in bloom, in which case the blossom might be killed, and the grain would, of course, not be produced. Frost sometimes has the same effect.—GEN. SEC.]

COST OF HARVESTING.—Paper read at Port Broughton Branch was read, and members cannot understand how the cost of stripping and cleaning a crop of wheat could be made so high.

Mount Pleasant, October 11.

Present—Messrs. G. Phillis (chair), John Maxwell, J. A. Naismith, F. Thomson, H. A. Giles (Hon. Sec.).

CONGRESS.—Chairman reported on what he heard at the Bureau Congress, especially referring to Professor Lowrie's address, which was much appreciated.

ENSILAGE.—A long discussion took place on the value of ensilage. The Hon. Secretary has laid down ensilage for twenty years past, and strongly recommended the practice by every owner of live stock. By a little extra expenditure the pits or stacks can be filled with herbage which at the time may be

nearly valueless; but when green feed becomes scarce it will be of considerable value, not only in preventing falling off in condition through lack of sufficient food, but also in maintaining the good health in stock, and preventing "dry bible," acute indigestion, and other complaints arising from use of dry and un-nutritious food. On the 4th of February this year a grass fire destroyed all feed on his paddocks; but his 100-ton pit of silage, made from fourteen acres of specially grown forage, enabled him to pull through with twenty cows in full milk and good condition. He used also a little purchased food, as usual in all seasons.

Mount Remarkable, September 26.

Present—Messrs. J. E. Jorgensen (chair), W. Lange, J. B. Morrell, G. P. Yates, J. McIntosh, H. N. Grant, W. Morgan, T. P. Yates, and A. S. Marshall (Hon. Sec., *pro tem.*).

CONGRESS.—Messrs. Jorgensen and McIntosh reported on proceedings at Bureau Congress, and upon various exhibits they inspected at the spring show. Other business left over till next meeting.

Gladstone, October 5.

Present—Messrs. J. Gallasch (chair), W. Wornum, J. Smallacombe, J. Rundle, W. H. Brayley, J. Burton, G. M. Growden, J. Milne, D. Gordon, and C. Goode (Hon. Sec.).

KEEPING SHEEP ON THE FARM.—Mr. W. H. Brayley read a paper to the following effect:—

I think there are but few farmers in this district who do not keep at least a few sheep, if only to find themselves in mutton. All farmers who keep sheep would be sorry to have to run their farms without them now, as no stock will give a better return for the feed consumed. Wheat must always be the principal crop in the Northern Areas; but the keeping of sheep as an auxiliary cannot be dispensed with. If we would keep our land in good heart, the paddocks should be spelled alternately and grazed. Sheep are very useful to feed down a paddock before it is fallowed, when it can be fed pretty close before it is ploughed, and they are also useful to feed off some of the weeds that grow on the early fallows; but I would not let them on the fallow before they are shorn, otherwise the wool will get earthy and suffer in consequence. After they are shorn they may run over the fallows, off and on, right up to seed-time. The first thing before getting sheep is to sheep-proof all the fences. It is better not to have the paddocks too large, as by having more and smaller paddocks the sheep can be changed oftener, as in the case of ewes with lambs. A frequent change is much better than keeping in one large paddock all the time. One of the greatest mistakes a farmer can make is to over-stock. It is better to let some feed go to waste each year than to keep the flock half-starved nearly all the year. There is more profit in one good sheep well kept than two poor ones. They should at all times have free access to plenty of water, as well as feed, during the summer especially. After harvest, when running in the stubble, they require water every day; but will do every other day if running on natural grass land. Opinions will always differ as to the best breed of sheep to keep. No doubt there is profit found in all the different breeds if kept in suitable localities. My experience is with the Merino only, which, I think, will be found the most profitable all-round sheep on our Northern Areas with very few exceptions. Some farmers buy sheep simply for grazing, and sell again as mutton when fat; but those who breed their own sheep should aim to produce the very best quality of the particular breed he favors, and should not be satisfied until he has attained as near perfection as his knowledge and circumstances will permit. As farmers we cannot all be breeders of prize sheep; but, by careful attention in selection, carefully culling out the inferior members at shearing-time, keeping the best ewes only to breed from, and using rams from the very best strains at command, it is possible to greatly increase the profits of keeping sheep. It is also a mistake to keep old sheep. They should be got rid of as soon as they have become full-mouth, if not before, as the wool becomes lighter and weaker in staple and of less value each year after full-mouth. The farmer, by breeding a certain number each season, should have just about enough young ones to take the place of all the old ewes that it may be necessary to cull. All the wether lambs could be sold as fat lambs if in suitable condition, otherwise there

is a danger of getting over-stocked. In the case of small flocks, most of the culls may be used on the farm. Breeding lambs for the English market is now an established business. The large-frame well-bred Merino ewes crossed with the Shropshire or Dorset Horn rams are found most suitable for breeding lambs for export. The advent of commercial fertilisers seems to have a marked benefit on the pastures as well as on the wheat, and, I think, with constant use, will enable us to keep more stock than hitherto and keep them better. There are some weeds that sheep will not eat unless they are starved to it, and, though it may be better for the land to have them kept down, I think it would not be the most profitable for the sheep. I think all such weeds as sheepweed, stinkweed, &c., growing on fallows should be cleaned by the scarifier. Sheep will do a lot better when left quietly to themselves in the paddock, where they can go to water whenever they are inclined. The less they are meddled with the better—especially, if a dog is kept, the less it is used the better. Small flocks can be managed without a dog on the farm, and certainly with a great deal less worry to the sheep.

In discussion it was elicited that over-stocking is not commendable. Keep sheep as quiet as possible, and work without dogs if that can be avoided. Cull out the oldest and worst sheep every year—especially ewes which have proved bad mothers, keeping only those which have raised thrifty lambs. For export lambs cross Merino ewes with Shropshire or Dorset Horn rams; Crossbred ewes make better mothers than Merinos, but their wool is of less value. Sheep-proof fences are essential to profit in sheep-keeping, and moderate-sized paddocks are desirable.

MEETINGS.—It was decided to meet as usual during the harvesting season, and one copy of the latest issue of the *Journal of Agriculture* to be laid on the table at each meeting. [Both are good resolves. When a Branch begins to shirk meetings the members quickly lose interest, and many fail to attend when the meetings are resumed.—GEN. SEC.].

Mount Bryan East, September 28.

Present—Messrs. T. Wilks (chair), W. Brice, B. H. K. Dunstan, A. Pohlner, J. Honan (Hon. Sec.), and four visitors.

ANNUAL REPORT.—Nine meetings were holden during the past twelve months, with an average attendance of five members. There were only nine on the roll.

CONGRESS.—Hon. Secretary reported on his attendance at Congress and visit to the Agricultural College.

OFFICERS.—Retiring officers were thanked for their services Mr. A. Pohlner was elected chairman, and Mr. J. Honan re-elected Hon. Secretary.

EXHIBIT.—By Mr. Brice—Very good lettuces.

Port Pirie, September 28.

Present—Messrs. P. J. Spain (chair), E. J. Hector, H. B. Welch, T. Johns, G. M. Wright, G. Hannan, T. Gambrell, J. Lawrie, T. Jose, S. Smith, T. H. Wilson (Hon. Sec.), and one visitor.

CONFERENCE.—Hon. Secretary reported that the next conference of Northern Branches is to be holden at Crystal Brook.

BEST VARIETIES OF WHEAT.—In discussing Mr. Kahlbaum's paper he referred strongly to the necessity for care in sowing and in harvesting, as well as in selection, to keep the variety pure. Dr. Cobb was careful in raising his seed wheats on separate plots for his own and for farmers' use, and similar plots should be established all over the State for wheats suitable for the different localities. It is not wise to try many varieties. It might be advantageous to screen out the small grain to make a large plump lot for seeding, but if the

practice is not persisted in the sample will soon run back to the original condition, as was proved by Major Hallett. Selected seed soon deteriorates, but it has yet to be proved that crossbred wheats keep their characteristics longer than the selected kinds; but some crossbred varieties become fixed in shorter time than others. Mr. Farrer says he fixed some in four years, and others required ten years to become fixed. The percentage of gluten in South Australian wheats is as high as in the Manitoba wheat, but is poorer in quality. Flour made from Ward's Prolific wheat requires mixing with better sorts to improve its quality, as also does that of King's Early, which is a very poor milling wheat.

Bowhill, October 5.

Present—Messrs. J. T. Gregory (chair), J. F. A. Dohnt, H. F. Baker, J. F. P. Warman, J. Waters, W. Towill, E. P. Weyland, A. R. G. Dohnt, J. McGlashan, J. G. Whitfield (Hon. Sec.), and three visitors.

HOMESTEAD MEETING.—This meeting took place at Mr. Towill's farm for the purpose of inspecting a number of plots of wheat sown together with various manures. The following plots were examined:—

1. Dart's Imperial, 30lbs. seed per acre, drilled in with 60lbs. English super. on fallow.
2. Dart's Imperial, 30lbs. seed per acre, drilled in land dressed with stable manure fallowed in.
3. Dart's Imperial, 30lbs. seed per acre, drilled with 84lbs. Thomas phosphate.
4. Dart's Imperial, 30lbs. seed per acre, drilled with 140lbs. English super.
5. Same, with 168lbs. Thomas phosphate.
6. Same, with 34lbs. Thomas phosphate.
7. Same, with 60lbs. English super., with a land not manured. The difference was remarkable.
8. Plot drilled with [fertiliser not reported.—GEN. SEC.] two months before the seed was sowed broadcast, then scarified.
9. Ploughed in same as No. 3, but without manure.
10. Red Straw wheat, 46lbs., drilled with 200lbs. English super.
11. Same wheat, 46lbs., drilled with 150lbs. English super.

Members considered that the plots sown with 60lbs. English super appeared to be the most satisfactory, and promised better results than Thomas phosphate. Mr. Gregory, a visitor, considered his land at Hamley Bridge doubled in value since he had commenced to use super. Members and visitors were entertained at the tea table by Mrs. Towill. Thanked.

Crystal Brook, September 28.

Present—Messrs. J. C. Symons (chair), W. J. Venning, G. Davidson, A. Hamlyn, W. Hamlyn, and F. S. Keen (Hon Sec.).

CONFERENCE.—The adjacent Branches having decided that the next Conference shall take place at Crystal Brook, it was now fixed that it shall be holden during February, 1902, and members undertook to do all in their power to make it successful.

CONGRESS.—Messrs. Symons and Venning reported on their attendance at the Annual Congress of the Bureau. Mr. Symons attended every session, and was greatly pleased with all he saw and heard. He described what he saw also at the Port Adelaide Export Produce Freezing Works, at the Dry Creek slaughter yards in connection therewith, and at the Roseworthy College. He was of the opinion that the produce export business will prove immensely beneficial to farmers as it will enable them to command the best markets. Mr. Venning had a lot of other business to attend to, and was able to attend only some of the Congress sessions. He had arrived at the conclusion that most of

the papers did not come to any finality on any particular question. [This evidently means that there was *no end* to the good things provided at the Congress, with which opinion I agree.—GEN. SEC.]

FUTURE BUSINESS.—Decided that at next meeting members will consider advisableness of each member in turn undertaking to read a paper or provide seasonable subjects for consideration at each consecutive meeting, as is done by several other Branches.

Swan Reach, October 17.

Present—Messrs. P. A. Beck (chair), R. J. Harris, L. Fidge, W. Hecker, A. Mieke, B. Schwartz, and J. L. Baker (Hon. Sec.).

FOREST RESERVE.—Bakara Branch wrote asking this Branch to support agitation for establishment of a forest reserve in this locality, but members decline, as they think such a reserve would prove to be a permanent harbor for vermin.

Mount Compass, October 15.

Present—Messrs. M. Jacobs (chair), W. Gowling, R. Peters, R. Cameron, F. Slater, F. McKinley, E. C. Good, C. S. Hancock, A. J. Hancock (Hon. Sec.), and three visitors.

SEASONABLE HINTS FOR NOVEMBER.—Plant potatoes; sow melons, pumpkins maize, sorghum, broom corn, peas, beans; plant out cabbages, tomatoes, and celery.

EXHIBIT.—Mr. E. Hancock tabled sample of the first locally-grown lemons; good quality and fairly thin-skinned.

APPLE BLOOMS.—Mr. F. McKinley has four Cleopatra apple trees, two years old, all in similar soil, all treated alike, yet two are covered with bloom and two have none. Why is this? [Who knows? Perhaps the two in flower were older when planted than the other two.—GEN. SEC.]

PIGS.—Chairman advocated purchase of a good pure-bred boar, by co-operation, for the purpose of improving the breed of pigs in the locality, the pig to be kept by one member and the others to contribute to its keep. Mr. F. Slater agreed, and said he had kept one sow since July, 1900, the progeny for which had turned in £11 4s. 2d. at a cost of £3 19s. 6d. Mr. McKinley said mongrel sows put to a good class of boar would breed good pigs. Mr. Gowling considered that it would pay best to buy store pigs and fatten them, as only one breed of pigs could be raised with profit in a year. Other members agreed with the Chairman, and inquiries will be made as to price and pedigree of a first-class Berkshire boar.

Boothby, October 1.

Present—Messrs. J. T. Whyte (chair), R. M. B. Whyte, R. Chaplin, J. R. Way, R. Carn, and M. Leonard (Hon. Sec.).

BULL.—Decided to raise a fund, and seek a subsidy of one-half, for purchase of a Shorthorn bull of a milking family, for the purpose of improving the dairy herds of the district.

BEST WHEAT FOR DISTRICT.—Opinions differ as to which is the most profitable wheat to grow. Steinwedel, Rattling Jack, and Purple Straw seem to have most favor, the first having most support, though its tendency to shake out is against its claim to general adoption.

BEST WHEAT FOR HAY.—Mr. R. Carn said he found Ward's Prolific

made splendid hay. Mr. Chaplin finds White Tuscan stools well, is highly nutritious, and is much liked by horses. Stock usually prefer Tuscan stubbles to other kinds. Some members favor bearded wheat, on account of the fineness of the straw. Steinwedel is emphatically condemned as a wheat for hay.

BUSH FIRES.—Owing to the wealth of grass and herbage in this locality it is imperative, for the protection of crops and paddocks, that strips should be freshly ploughed around them, and that settlers should adopt every precaution to prevent fires and to cope with any that should occur.

MILK AND GORE.—Mr. Chaplin has a cow which calved first time two months ago. For six weeks past her milk has been pure during the first part, and towards the end it is nearly all blood. So far as known she has received no injury to account for the gore. [The Dairy Instructor says the blood is due to a rupture in the udder. It is quite usual for the milk to be pure at first, and blood to follow in the strippings. He advises fomentation.—GEN. SEC.]

Forest Range, October 17.

Present—Messrs. J. Rowley (chair), J. Green, R. E. Townsend, William McLaren, G. Monks, A. Green, E. Rowley, F. Green, A. S. Gunning, and H. H. Waters (Hon. Sec.).

AMENDED RULE.—"Any member absenting himself from two consecutive meetings without sending an apology deemed to be valid by the other members present at the meeting, shall be notified by the Hon. Secretary, when calling the following meeting, that should he be absent from that meeting his seat may be declared vacant, unless such member has been granted leave of absence." [This rule should be adopted and rigidly enforced by every Branch.—GEN. SEC.]

NEW RULE.—"An alphabetical list of members to be made, and each member in rotation on the list is to read a paper or initiate a discussion upon a suitable subject at the meeting following that taken by his predecessor on the said list."

HOW TO PLANT POTATO SETTS.—In answer to questions, members recommend to cut setts several days before planting, and plant the setts cut sides up. Freshly-cut potatoes, especially if planted cut side down, are liable to rot.—[Read a par. on this subject in "Notes and Comments" in this issue.—GEN. SEC.]

Millicent, October 3.

Present—Messrs. H. F. L. Holzgreffe (chair), A. McRostie, B. Varcoe, H. Oberlander, G. Mutton, R. Campbell, H. Hart, H. A. Stewart, H. Warland, S. J. Stuckey, and E. J. Harris (Hon. Sec.).

LIBRARY.—The Branch library is progressing, and Lichtwark's "Educating the Horse" has just been placed on the catalogue.

CONGRESS.—Chairman reported on proceedings at the Fourteenth Annual Congress; also on presentation of illuminated address to the Chairman of Central Bureau. He had procured four full-size photos. of the address, one of which he presented to the Hon. Secretary in recognition of his extra work in correspondence connected with getting up the affair, in which nearly every Branch of the Bureau took a part. The Branch presented one copy to the local institute, and one copy to be framed and hung in the meeting-room. Chairman also reported having inspected the Holstein bull at Port Victor, and Mr. Porter had since sent it on to Millicent.

PLANTS FOR DISTRIBUTION.—Mr. H. Oberlander brought in a number of plants of onions, lettuces, and tomatoes for distribution to members present.

NOXIOUS WEED.—Hon. Secretary tabled specimen of wild onion (*Asphodelus fistulosus*), found on Mr. C. W. Harris's block at the back of the township. [This weed has been proclaimed as a noxious weed within the meaning of the Act, and it is the duty of the district council to have it destroyed. Members of Branches would do well to agitate continuously and insist upon action being maintained against noxious weeds and pests against which legislation has been passed.—GEN. SEC.]

RED SPIDER.—The leaves of peach trees in many places are dropping off, owing to the attack of red spider (*Tetranychus tellarius*), one of the mite family, which is very small, and is found mostly on the under side of the leaves. The palliative treatment at present is dusting with flowers of sulphur. To cure the disease spray in winter with lime, sulphur, and salt compound. Strong tobacco wash can also be used as a palliative.

Mannum, September 27.

Present—Messrs. J. G. Preiss (chair), J. L. Scott, R. P. Scott, J. A. Schulze, F. E. Schuetze, J. W. Haby, B. Baseby, A. G. Lenger, and W. H. Quartly (Hon. Sec.).

CROPS.—Mr. Preiss mentioned that the recent warm weather had forced the wheat into ear, and that the plants had stooled very little.

SHEEP WEED.—Mr. Walker said the sheep weed is very prevalent this year.

Golden Grove, September 26.

Present—Messrs. R. Smith (chair), G. A. Milne, A. Harper, F. Buder, J. Woodhead, W. Mountstephen, F. G. McPharlin, J. Ross, J. R. Smart, J. R. Coles (Hon. Sec.), and two visitors.

DAIRYING.—Mr. J. R. Coles gave some of his experiences in feeding cows, and promised to read a paper at next meeting.

GRAFTING.—Mr. Buder showed some examples of grafting.

Balaklava, October 12.

Present—Messrs. P. Anderson (chair), C. L. Reuter, G. Reid, A. Manley, W. H. Thompson, W. South, A. W. Robinson, J. Crawford, J. Vivian, E. Hains, W. H. Sires, W. Tiller, G. C. Neville, A. Hillebrand, E. M. Sage (Hon. Sec.), and one visitor.

KING'S EARLY WHEAT.—The Hon. Secretary tabled correspondence with Mr. J. Darling, M.P., in reference to this wheat. He had noticed letter from Mr. R. Marshall in the weekly papers referring to statement alleged to have been made to Professor Lowrie by Mr. Darling, and, thinking there had been some misunderstanding, he wrote to the latter, pointing out that Mr. Marshall had apparently got a wrong version of the professor's remarks. The facts were that a visitor asked the professor as to the refusal of merchants to buy King's Early wheat, and he replied that Mr. Darling had told him that if the farmers grew this wheat he was prepared to find a market for it, but it would probably be at a reduced price. Mr. Darling had now written him (Mr. Sage) that, while he was not in favor of this wheat being largely grown, and that quality, as far as Australian wheats were concerned, should be the first essential, still if this

wheat was grown to a large extent he had no hesitation in saying he would be only too happy to find a market for the produce, but *it would be at a reduced price*. He believed Mr. Sage's version of the professor's statement correct, and it most clearly represents the actual position. Mr. Sage said he was not with the professor in his advocacy of this wheat, believing that the quality of the produce should as far as possible be considered first; but it was only fair to the professor to correct the misunderstanding. In reply to question as to the hard red Manitoba wheat making high-quality flour, Mr. Sage said he believed several grades of flour were made from it, only 20lbs. to 25lbs. per bushel being of the first grade, whereas with South Australian wheats only one grade was made. Members considered the quality of our wheat inferior to what it used to be. Mr. Sage thought we had better stick to our soft white wheats, as we had the market to ourselves to a large extent, whereas if we grew the red wheats we would have to compete with the whole world.

AFTER-EFFECTS OF FERTILISERS.—Mr. Robinson called attention to the marked effect a liberal dressing of manure on the crop had on the pasture following. The crop of feed on the Roseworthy College land was proof of this, the feed having been more than doubled through the use of fertilisers.

LAMBS FOR EXPORT.—Mr. Robinson said he was of opinion that the Dorset Horn ram crossed with Merino ewes would give the most profitable lamb. Other members thought much would depend upon the class of land to be utilised. The Merino was best for poor dry country.

Stansbury, October 5.

Present—Messrs. A. Anderson (chair), P. Anderson, C. Faulkner, J. Henderson, G. Jones, and P. Cornish (Hon. Sec.).

WEEDS.—Mr. Faulkner proposes to try the following method of eradicating weeds:—Plough early, work the land well, sow to barley, then use it for fattening lambs. After that, fallow and work well. The weeds will grow and be killed out, and the land will be ready for wheat the following year.

SALTBUSH.—Mr. P. Anderson showed a branch of saltbush grown on his farm from seed sown last year. It seems to be growing well; but owing to the very dry weather last year very little of the seed grew then, and it is germinating now, having lain dormant through the unfavorable conditions.

WEIGHT OF CHAFF.—Members strongly protest against regulation of weight of a bag of chaff by law, as it is almost impossible to make a uniform weight. Some chaff is very light; other chaff contains a lot of grain, causing it to be heavy and the bags would not be half full. [Notwithstanding which a bag of chaff as sold by retailers is always supposed to contain 40lbs. of chaff.—GEN. SEC.]

Bute, September 24.

Present—Messrs. W. H. Sharman (chair), E. Ebsary, A. Schroeter, H. Schroeter, M. Stevens, F. Trengove, J. H. Brideson, R. Commons, A. Sharman (Hon. Sec.), and one visitor.

BOILED WHEAT FOR HORSES.—Attention was called to error in report in September issue of the *Journal*. Mr. Ebsary stated that salt put in the water in which the wheat is boiled will prevent the wheat swelling, and not that salt *should* be placed in the water, as printed in the *Journal*. He also asked whether coarse and gritty supers. would produce as good returns the *first year* as the very fine manure. [The finer the manure is ground the more readily will its fertilising constituents be available to the roots, but with ingredients soluble in water there is not so much necessity for very fine grinding.—GEN. SEC.]

CONFERENCE.—Correspondence in connection with proposed Conference of Branches to be held at Bute in February next were dealt with.

SHEEP ON THE FARM.—Mr. Ebsary called attention to report of Nantawarra Branch in September *Journal* in which it was stated that the land in the district would carry two sheep to the acre. Members were of opinion that the land in the Nantawarra district was not capable of carrying more than a sheep to the acre. [This was a mistake; one sheep to two acres was the estimate of the carrying capacity of the district in question.—GEN. SEC.]

CONGRESS.—Messrs. Sharman and Frengrove reported on proceedings of Congress, and referred specially to Professor Lowrie's address on that occasion.

Kadina, October 10.

Present—Messrs. T. M. Rendall (chair), J. M. Inglis, T. H. Warren, D. F. Kennedy, H. Kennett, and J. W. Taylor (Hon. Sec.).

CONFERENCE.—Matters in connection with a conference of North Yorke's Peninsula Branches during February next were considered, and one member promised to prepare a paper.

CONGRESS.—The Chairman reported at some length upon what he saw and heard whilst on a visit to the city and attendance at the annual Bureau Congress. Crops mostly were in a backward appearance, and in some fields there were very many field poppies [which have already become a serious pest in some parts of this State.—GEN. SEC.]. The Congress was exceedingly well conducted, and was most enjoyable and instructive. Mr. Kennedy also spoke on the Congress proceedings, and was surprised to note that nearly all the papers came from the South-East, and one from Angaston was the furthest north representative of the literary efforts of the Bureau.

ATTENDANCE.—Decided not to cease holding monthly meetings during the busy season of harvesting, but that the rule as to regular attendance shall be somewhat relaxed where any member finds it inconvenient to attend.

FIELD TRIAL.—Hon. Secretary reported that the Paskeville Branch has the preliminary arrangements well in hand for the proposed field trial of harvesting implements, to be holden at Paskeville at an early date.

Angaston, October 5.

Present—Messrs. F. Thorn (chair), F. Salter, J. H. Snell, A. Friend, A. Sibley, J. Heggie, R. Player, S. O. Smith, W. Sibley, and E. S. Matthews (Hon. Sec.).

"INCREASING THE USEFULNESS OF THE BUREAU."—Members discussed Mr. W. C. Grasby's paper (see *Journal of Agriculture*, pages 243-4-5, October, 1901) as read at the late Congress of the Bureau, and arrived at the following conclusions:—

Central Bureau.

This does require attention. There should be a better average attendance of its members. Those members should be struck off whose other official duties prevent them giving the necessary time to their Central Bureau duties, which at present is very noticeable. An introduction of young blood would be an advantage, as at present, owing to age and infirmity of some of the members, most of the duties and all the work falls on the Secretary.

The grand work done by the Chairman is prominently recognised, but it is hardly fair to expect him to continue for all time.

The General Secretary's efforts should be better supported by the members of the Central Bureau.

With regard to the *personnel* of the Central Bureau, members do not agree with suggestions *a* and *b* (lines 21 and 22 from bottom of page 224). As regards *c*, it might be advisable that the Chairman should retire at end of one year's service, but to be eligible for reappointment.

Branches.

Members consider that each Branch should be constituted as at present with fifteen members only. Efforts should be made to ensure a much better average attendance at each meeting, and punctuality insisted upon. Every member who fails to attend for three consecutive meetings without a reasonable and written apology should be struck off the roll. [Angaston Branch has strictly adopted this practice recently, and three "drones" have received their *quietus*. —GEN. SEC.]

Members consider Mr. Grasby's suggestions made *a b c d* and *e*, with regard to the Branches, to be unworkable, and to a certain extent impracticable.

Lectures on scientific and other useful matters might more often be read at Central Bureau meetings, and have them published in the *Journal of Agriculture*.

The selection of Chairman and Honorary Secretary of a Branch ought to be very carefully conducted. Less attention should be paid to their *locus standi* in the district, and more to their ability to perform the duties of their offices.

Much of the poor work done by some of the Branches is due to the inefficiency and lack of zeal of the members, and is in no way attributable to weakness in the constitution, or to the rules of the Bureau. Drones should be removed, and workers only kept on the roll.

Members consider the *Journal of Agriculture*, of which each one receives a free copy, to be a great boon.

Orroroo, October 18.

Present—Messrs. W. S. Lillecraap (chair), E. Copley, R. Coulter, S. Roberts, W. Robertson, J. Jamieson, and T. H. P. Tapscott (Hon. Sec.).

ECONOMY IN FEEDING STOCK.—Discussion on paper read at previous meeting by Mr. Scriven, took place. Mr. Roberts thought it a wise economy to secure the best stock within your means, as it was more profitable to feed good stock than to attempt to secure equal results from inferior animals. Wheaten or "cocky" chaff should be well cared for; it is not economy to allow it to stand in heaps for weeks in the paddocks, as it bleaches and spoils with the weather, besides much may be lost by being blown away. It should be gathered into sheds or put in large heaps and covered as soon as possible. This wheaten chaff, mixed with an allowance of bran and pollard, is all the northern farmers have to depend upon for their stock in addition to any feed that may grow in in the paddocks. He preferred feeding horses on long hay to hay chaff, as they bolt a great deal of the latter if hungry. It was better to feed in loose boxes in the yard than in a close stable. Mr. Coulter agreed generally with Mr. Roberts. There was a great deal of practical information in Mr. Scriven's paper. Mr. Robertson was of opinion that if weights and measures were used a little more, instead of relying almost entirely on guesswork, one would have a better idea of the amount and value of the food consumed by their stock. Other members supported remarks of the writer. Members generally disagree with the General Secretary in the way he curtails and cuts to pieces papers contributed by them from time to time.

Minlaton, October 19.

Present—Messrs. John Anderson (chair), J. D. Mayer, T. Brown, H. Martin, E. Correll, R. G. Newbold, James Anderson, A. McKenzie, D. G. Teichelmann, and J. McKenzie (Hon. Sec.).

RED RUST.—Sample of wheat affected by red rust was tabled by Mr. Brown. Several members require to know what is the cause of this disease. [The red rust on wheat plants is the fruiting or seed-bearing portion of a microscopic parasitic plant or fungus, the mycelium (or "roots") of which exist within the tissues of the wheat plant. The patches of "rust" consist of hundreds of "seed-heads," containing millions of spores (or "seeds") which float away on the air, and any one of them lodging on a wheat plant may start growth with

the slightest breath of moisture, and within a few days fresh patches of "rust" will appear on the previously healthy wheat plants. A single badly-affected wheat plant maintains enough of "spores" of red rust to infect a hundred-acre paddock.—GEN. SEC.]

AGRICULTURAL CHEMISTRY.—Mr. Mayer's offer to deliver a series of public lectures under the auspices of the Branch was accepted with thanks. First lecture in public school on October 26th, at 8 p.m.

PRESERVING EGGS.—A member stated that he had kept eggs in perfect condition for a year by the aid of water-glass (silicate of soda). Others had kept eggs good for some time in solution of salt in lime water.

ATTENDANCE.—Resolved that the name of any member shall be struck off the roll if he fails to attend during three consecutive meetings without reasonable written excuse.

Pyap, October 16.

Present—Messrs E. Robinson (chair), B. Cox, W. Axon, J. Bowes, A. Westbrook, A. J. Brocklehurst, Geo. Napier, jun., J. Napier, C. Billett, G. H. Mills, J. F. Bankhead, W. Rogers (Hon. Sec.), and four visitors.

PEACH APHIS.—Mr. Cox said he had used kerosene emulsion with the best results for extermination of aphides on peach trees.

LOSSES ON WHEAT CROPS.—Mr. Westbrook read a paper indicating several of the losses to which an apparently heavy crop of wheat may be subject before the grain is marketed. The gist of the argument was as follows:—

Questions had been propounded at a recent meeting as to the reason why there is so small a return from grain sown on a field in view of the fact that a single grain will produce at least five heads, bearing, say, forty grains each, equal to 200 grains. Before the seed can be sown there is a loss of some grains in the weighing, others left on the floor, a number destroyed by the picking, some left in the dray or wagon, small seeds lodged in the seed-sower or drills, some left on stones and stumps in the field, others devoured by ringneck parrots, pigeons, crows, jays, sparrows, and other birds, carried off by ants, left exposed by the harrows, destroyed by rabbits, cracked by the stripper and vitality destroyed. Then the plants are injured by wind, heat, frost, rust, bunt, drought whilst growing, and when the heads are ripening the cockatoos, ringnecks, cockatoo parrots, rabbits, &c, take toll; a lot of grain is shaken out by the wind, or lost in the stripping, in the winnowing, cleaning, and bagging, besides what is missed on the floors, lodged in the winnower, and blown out in the screenings. He said there were 528,414 grains in a bushel of wheat; and if there were no losses, and providing that each grain produced thirty heads with forty grains, sown on a sufficient area of land, the yield should be 1,200 bush.

Members considered that stumps should not be left on the field. If seed is properly pickled there should be no bunt, and rabbits could be excluded by wire netting.

BUCKET CHURN.—Re sketch of churn in September *Journal* Mr. Billett suggested substitution of a piece of tinned iron with countersink hole for spindle, in place of the piece of wood which he thought would turn round. [If one goes away from the most simple, easily procurable, and readily constructed material in making these cheap and homely substitutes, would it not be more economical to purchase a small churn, or at any rate to make a real box or a dasher churn.—GEN. SEC.]

APRICOT TREES.—Mr. Brocklehurst said this season a peculiar and general departure from the ordinary manner of growth on apricot trees has taken place. Spurs, even when covered with flower buds, failed to flower, and developed wood growth instead. A spur about 12in. long, that was covered with flower buds, produced only two fruits near the end, the rest being wood growth. If the spurs are touched or shaken lightly the fruits drop off, and leaf buds are developed. The trees were watered early in February last, after the fruit was gathered, and again early in September, and 5.07in. of rain had

been registered between those dates. Held the opinion that the trees should have been watered whilst the flower buds were full, and that an August watering would have prevented the trouble. One orchard of eleven acres had been ploughed in August, and another of four acres left unploughed. In both cases the same conditions prevailed—wood produced in place of flowers and fruit. The varieties were Moor Parks and Manchester Seedlings, mostly worked on apricot stocks, but some on almond. The soil is sandy loam, with a limestone subsoil in parts. A member said similar conditions prevailed where the trees were growing near the main channels and getting whatever seepage there may have been. Mr. Brocklehurst had noticed several double blooms on apricot trees.

Mylor, October 19.

Present—Messrs. W. H. Hughes (chair), F. R. Newberry, T. Mundy, J. Nicholls, C. Nielsen, P. F. Probert, W. G. Clough (Hon. Sec.), and five visitors.

PRUNING PEACH TREES.—Mr. P. Probert read a paper on this subject. Dead wood should be pruned out, and systematic production of new wood should be aimed at, because the fruit is produced upon growth of the previous season, and developed upon branches of two or more seasons' growth. Care must therefore be taken when pruning not to cut away the wood that carries the flower buds for the next crop of fruit. Branches growing towards the centre and crossing branches should be removed. The trees should start to branch at about a foot from the soil, for, if much higher, the trunk will be exposed to the sun, which will scald the bark and kill the tree unless the stem is wrapped with hessian or otherwise shaded. The surface soil should be hoed to break the capillary action and prevent evaporation of moisture. Large wounds on trees should be painted or covered with grafting wax. Be careful to keep the balance of each tree, and do not prune too much on any one side. He had concluded that the best pruning is done in summer with the finger and thumb, by suppressing young growths when they are not required. Mr. W. H. Hughes said he had cured curl-leaf on peach trees by placing a double handful of sulphate of iron around each tree. Members do not consider the hilly country suitable for peach-growing, but if planted they should be heavily pruned at root and on top every three years. Aphides should be attacked on the roots, before they get up to the branches; this saves spraying later on.

SEASONABLE HINTS.—During the next month finish sowing lucern on damp soils; also sow all sorts of summer fodders and melons, pumpkins, &c.

PREVENTION OF SWARMING.—The Hon. Secretary described a method of preventing the swarming of bees—or rather the automatic transference of the bees which wish to swarm into an empty hive close by. He places an empty hive opposite the one that is liable to swarm, at a distance of 15in., the entrances being opposite. He makes a square passage way from one hive to the other. The bottom board is, say, 3in. wide and 15in. long, except at the ends, where the middle inch is extended $\frac{1}{2}$ in. to provide a lip that can be let in the entrances to the hives. The tunnel—or “bridge,” as he calls it—is about an inch square inside, and has a number of small holes on each side, just large enough to allow the workers to enter or to get out of the tunnel, but the queen and the drones can only travel between the empty and the full hives. On each side of the tunnel there is an alighting-place for the workers, being the remainder of the 3in. bottom board not occupied by the tunnel. The swarming bees get away to the empty hive, and settle down to work there in a short time, and then the tunnel is removed.

Davenport, October 17.

Present—Messrs. W. Trembath (chair), J. E. Lecky, J. Holdsworth, W. G. Pryor, W. Penna, T. Julian, T. Tottmann, A. McDonald, W. Hodshon, and J. Roberts (Hon. Sec.).

OFFICERS.—Mr. Trembath was re-elected Chairman, and Mr. J. E. Lecky elected Hon. Secretary for ensuing year. The retiring officers were thanked for their services.

CONGRESS.—Mr. Penna reported on the proceedings of Congress, and on his visit to the Roseworthy College Farm.

BEE-KEEPING.—Mr. McDonald read the following paper on this subject:—

Bee-keeping, poultry-breeding, and fruit-growing go together perfectly; for the small farm they are particularly suited, as they can be made to add materially to the revenue of such a place. For the fruit farm they are almost indispensable, as they distribute the pollen of the flowers of the fruit trees and ensure good crops when failure would result if it were not for their labor.

The question then arises, Can plants be grown for bees that will be a profit? No; not for honey alone. If an apiarist wants honey-producing plants it is necessary that such crops should be useful for other purposes, such as a fodder plant, poultry food, or green manuring plant. Then honey-producing plants would be profitable. Take, for instance, a crop of buckwheat, one of the most valuable and generally useful crops that can be grown. One, two, and even three crops in mild districts can be grown in the year, provided there has been no long drought. It is very hard to say why this most important crop is so neglected. It is the best crop for honey, the best crop for egg production and health of the fowl; it is a good fodder plant also. The rich buckwheat flour is scarcely ever heard of. Every farmer should grow it, and use the flour in the household. There are several other useful plants, such as clover, cow peas, mustard, rape, and sunflower, all of which will produce a honey of excellent flavor. Small fruits, such as raspberries, strawberries, and blackberries, give rich-flavored honey, and what is better for the family to attend than such delicious and healthy fruits? Of the large fruit trees, apples, plums, pears, and peaches, all, I presume, know what a valuable aid the industrious bees are in their fertilisation. A single hive will in an ordinary season furnish a family with, say, about 100lbs. of honey; so I should say provide at least two swarms; then if there is a surplus it can be as readily disposed of as butter or eggs, while for beeswax there is always a demand at cash prices. As a food there is no more sweeter or more wholesome; it is a delicacy that is always ready when company comes unexpected, and it should also be highly prized for its medicinal properties.

The cold winter winds should be provided for in the shape of windbreaks, which are most beneficial to the bees; and I should say plant evergreen trees, as they make a permanent wind-break and shade the bees and poultry from the powerful rays of the summer sun as well. For this purpose I should recommend the lucern tree (*Tagasaste*), which grows to a height of 20ft., and is a neat evergreen that in the early spring produces one mass of white pea-shaped blossoms, that feed the bees before any other plant almost. But the great value of the lucern tree is its usefulness as a hedge plant, and especially round an apiary, on account of being a honey producer. In two years it makes a really good shelter; in four years, by trimming well back annually, it becomes quite thick and as high as wanted. The plants should be put out 2ft. apart, or not more than 3ft., for a hedge. Always plant trees, which will also adorn and beautify your home. While Australians are destroying every gum tree on their farms other countries are planting thousands, because they have found out the value they are to the health of the people.

Bees do not need much attention during the winter, and should not be molested or handled in any way whatever. Spring is the season when the bees are in most danger of starvation. Watch your colonies and feed the destitute until the honey crop opens. When food has to be furnished you can give them candy; this may be made in cakes from sugar in the ordinary manner, and place on the combs directly over the bees. Do not feed at the entrance or out of doors, as this teaches the bees to rob. One bee in September is worth ten bees in December, as it is the early bees that help to breed the large swarms. In early spring remove the drone comb and replace it with worker comb. Remember that every pound of comb costs the bees about 10lbs. of honey; this is why the business of foundation-making has taken such great proportions. The use of comb-foundation not only saves a great deal of time and labor to the bees, but it also secures straight combs in the frames and does away with the over-production of drone comb. The honey harvest lasts but a few weeks, so you must be ready for it. This should be done by placing the foundation-comb in the honey boxes when the bees will at once take hold and begin storing honey in them. These honey boxes should be promptly taken off as soon as filled, which should be in about two weeks, when other empty ones should take their place. Keep putting on and taking off, keeping the bees

at work while the honey season lasts. When the bees fill all their space, and have no more room to work in they usually swarm, and if they swarm they will not store much surplus honey; so by thus keeping them in plenty of storage room they are usually content to work away and store honey without attempting to swarm.

Much dirt and filth accumulates in the hive during the winter, and it is only the strongest colonies that can remove it; but we should not depend upon them to accomplish this, but set to work and clean them all out during fine days while the bees are out on the wing. Bees consume large quantities of water during spring. When they can gather nectar from the flowers they usually can get enough water to do them, but when honey is not coming in they make a rush for the water; so that it is very necessary that they have access to convenient watering-places, and if it is not handy it should be furnished to them. Ordinary open vessels will not answer, as they drown in large numbers. A leaky barrel, or, as bees like salt to some extent, an old salt barrel that will hold water after being soaked up and still leak enough to supply the bees, will answer the purpose; but in all cases a watering-place should be fixed up for them near the apiary, for when once they take to a certain watering-place it is a hard matter to get them broken away from it.

In selecting bees I should recommend the Italians, as they are the best breed and are not so aggressive as the native black bees. Stingless bees have been discovered in the island of Montserrat, and British naturalists are trying to encourage the propagation of the species with the hope of supplanting the bees which have stings.

My object in taking up this subject is to show that I believe every farmer and fruitgrower should have his colony of bees, and to the beginner I should say get Doolittle's work on "Queen-rearing" and "The Colonial Beekeeper." The former is a valuable work, and can be obtained for 5s, and the latter for 1s. In these books you will find the course you have to pursue, not forgetting the fact that you must learn the locality you place yourself in.

Members doubted whether bees could be kept profitably in this district on account of the long distances they would have to travel for their food. Tree lucern has been tried here by several, but does not thrive, only reaching about 14in.

Lipson, September 28.

Present--Messrs. G. Provis (chair), H. Brougham, Charles Provis, A. B. Wishart, J. McCallum, George Carr, W. F. Darling, James Brown, E. J. Barraud (Hon Sec.), and two visitors.

EXHIBITS.—Mr. James Brown tabled splendid sample of Steinwedel wheat, 4ft. 9in. high, grown without manure. Mr. Chas. Provis tabled weed believed to be red poppy. [This weed is over-running large areas of our wheat-growing lands, to the serious loss of the farmer. Those who have only a few plants about will do well to pull them up and burn them. No trouble will be too great if the farm can be freed of this weed.—GEN. SEC.].

HARROWING GROWING CROPS.—The Chairman thought it would be beneficial to harrow the crop at the right time, but great care must be taken that the ground is neither too hard or too wet, as there was danger then of doing harm.

FERTILISERS IN CLAY SOILS.—The Hon. Secretary pointed out the difference in results of use of manures on different soils. Superphosphate did not give anything like the same returns on clay soils, in this district, as it did on loose friable land. He believed this was partly due to the fact that with heavy, hard clay the air did not penetrate freely and the supply of nitrogen was not renewed to the same extent as on light soils, and suggested that it would be wise to experiment with nitrogen in the form of sulphate of ammonia applied with the super. [The only way to solve this difficulty is by experiment. Probably Thomas phosphate would be worth testing, as it usually gives better results in this State on heavy soils than on light. The lime in this fertiliser would undoubtedly have a beneficial effect. A good dressing of lime early in the autumn should also be tried.—GEN. SEC.].

VEGETABLE GARDEN ON THE FARM.—Mr. Chas. Provis read a short paper on this subject. In his opinion no farm is complete without a small garden. Vegetables can be grown in most parts of the State, and in this district with a

fair amount of certainty. The first thing is to select the land for the garden ; a good deep **sandy loam** was best, particularly when the rainfall is rather uncertain, as it will retain the moisture longer and allow the roots to penetrate deeply, besides being so much easier to work. The ground should receive a plentiful supply of manure and the vegetables put in early in this district—not later than May, and earlier if possible. Do not be afraid to spend a little time in thoroughly preparing the ground, as the results will well repay the trouble taken. The waste and spare green stuff from the garden will prove very useful for the poultry and pigs and even the cows, all of which will be the better for it. If none but heavy clay land is available, dig in a good layer of sand and manure. A sheltered spot facing the morning sun should be chosen for the garden. Members thought the idea of using sand and manure on heavy land a good one. [If a good dressing of lime is applied early in the autumn to such land it will be found beneficial. Crushed sea shells will also do much good. Lime makes heavy clay soils more friable and prevents caking.—GEN. SEC.]

PARALYSIS IN PIGS.—Mr. Brown reported that one of his pigs had lost the use of its legs, which was attributed by other members to want of exercise. [Give the pig a purgative—4ozs. to 6ozs. Epsom salts in skim milk. Plenty of exercise and a free supply of charcoal and ashes with a little common salt will assist to keep the pigs healthy and prevent such complaints. Keep the mixture of charcoal, &c., in a box where the pigs can get it at any time.—GEN. SEC.]

Caltowie, October 21.

Present—Messrs. J. Leahy (chair), J. Neate, J. Potter, G. Petatz, A. Kerr, M. E. Wilson, N. E. Hewett, J. G. Lehmann, and F. W. Lehmann (Hon. Sec.).

COST OF WHEAT-GROWING.—Mr. Kerr furnished the following estimate of cost of farming on a 640-acre farm in this district, with an average return of 10bush. of wheat per acre :—

INCOME.		£	s.	d.
Three hundred acres cropped, yield 3,000bush., at 2s. 6d.		375	0	0
Profit on 150 sheep		30	0	0
Profit on cows		8	0	0
Profit on poultry		6	0	0
Total		£419	0	0
EXPENSES.		£	s.	d.
Rent of land, at 3s. per acre		96	0	0
Rates and taxes		5	0	0
Labor		100	0	0
Manure		37	10	0
Seed, 250bush.		31	5	0
Blacksmith, saddler, sundry repairs		15	0	0
Hay		30	0	0
Depreciation		20	0	0
Total expenses		£334	15	0
Net income, £84 5s.				

Members were disinclined to believe that 150 sheep could be kept on such a farm. Mr. Leahy did not think cows would realise £8 per annum under their conditions. Mr. Kerr's estimate of revenue was too high and expenses low. Interest on stock and building should have been added to the expenditure. Mr. Hewett was of opinion that 10bush. was not high enough average where manure is used ; but Mr. Neate considered the allowance for manure insufficient, as 50lbs. per acre was not enough for land cropped every second year. Mr. Lehmann considered Mr. Kerr's estimate a very fair one. The farm could not be worked for less. Messrs. Neate and Hewett had found cows and poultry very profitable.

Narridy, October 12.

Present—Messrs. J. Darley (chair), D. Creedon, E. Smart, J. Smart, A. Rowe, J. Nicolson, R. Satchell, B. Flavel, J. Liddle, and Thos. Dunsford (Hon. Sec.).

CONGRESS.—Delegates reported on proceedings of Congress and on visit to the Produce Export Depot at Port Adelaide.

DAIRY INSPECTION.—Discussion took place on paper read at Congress on the subject of dairy inspection. Members were divided in opinion on the question, the general opinion being that while there might be a necessity for inspection in dairying districts it did not apply here.

WHEAT EXPERIMENTS. — Mr. Satchell wished to know whether the wheats sent out by the Bureau were new kinds, or had they been tried in the State before. He had hand sown at considerable trouble some Dart's Imperial wheat received from the Branch, while hundreds of bags of the variety could be procured at the same time. [The wheats sent out are mostly newer kinds, but the Bureau does not distribute every new wheat or old wheat under a new name that is boomed without having some knowledge of its qualities, and this can only be obtained from someone who has tested it. When Dart's Imperial wheat was first distributed by the Bureau it was not largely grown north of Adelaide, but the same year considerable quantities were sown. If a member knows that any variety sent out by the Bureau is already grown in the locality, he should exercise his own discretion as to whether to sow it or not.—GEN. SEC.]

Inkerman, October 22.

Present—Messrs. W. Fraser (chair), J. Sampson, D. Fraser, C. H. Daniel, C. E. Daniel, J. Lomman, and W. A. Hewett (Hon. Sec.).

HON. SECRETARY.—Mr. W. A. Hewett resigned his position as Hon. Secretary, and Mr. C. E. Daniel was elected to fill the vacancy.

CONGRESS.—Mr. C. H. Daniel reported on proceedings of Congress. He had gained a lot of useful information, and referred particularly to Mr. D. F. Lawrie's remarks *re* in-breeding of poultry. Since his return from town he had come across a marked instance of the results of in-breeding in geese. Out of a brood of eleven goslings only two lived, and he found that the parents were too nearly related to each other. Mr. C. E. Daniel reported on the visit of inspection paid to the Roseworthy College, and highly praised the dairy herd, the pigs, and sheep.

Clarendon, October 14.

Present—Messrs. J. Pelling (chair), J. Piggott, J. Wright, A. Harper, W. A. Morphet, W. Raisbeck, W. Spencer, A. Hilton, J. Chapman, E. Dunmill, and A. L. Morphet (Hon. Sec.).

CONFERENCE AT MYLOR.—Several members reported on proceedings of Conference at Mylor on September 26.

FARM MANAGEMENT.—Mr. Piggott read a paper on this subject to the following effect:—

Fencing.—Posts should be cut 6in. by 4in. and 5ft. 8in. long. Put them 20in. in the ground, and for cattle use four wires, and seven if sheep are kept. For cattle the top wire should be 3ft. 10in. from the ground, the second wire 12in. lower, the next 10in., and the bottom wire 9in. lower. For sheep there should be 10in. between the top and second wires and 6in. between each of the others and between the bottom wire and the ground. By using the large fencing wire you can make a stronger fence with six wires than with seven of the thinner wires. Posts should be 8ft. to 9ft. apart, and there should be thirty-five to forty posts in a strain. Short strains are difficult to keep tight.

Stocking.—Do not overstock; it is one of the greatest mistakes we can make. It is better to have feed to spare than to run the risk of having more stock than you have feed for. Cattle kept on hard fare are more likely to break the fences and find feed elsewhere, causing trouble and annoyance. It is better to rear two calves well than to half feed four. The treatment the calves receive when young makes all the difference in the quality of the cows. Do not bring the heifer into milk until she is two and a half years to three years old. She will make a better and stronger cow than if bred from earlier. Keep a good bull and change him every second year. Keep him in a yard, and only rear the best calves from the best cows. Fatten the others for market. Do not keep too many horses. A few well fed and well looked after will do a lot of work.

Cultivation.—It will pay, even with our small holdings, to fallow. With only sixty acres it is better to fallow half each year and use manures; it does not pay, however, to use manure on stubble land. Put in a few acres of peas each year. The pea haulms will be found very useful, and a pea crop helps to clean the land. It will pay to use the drill for putting in the crops if manure is used, but not otherwise. The binder is the best machine for taking off the hay crop. Chaff all the hay used on the farm; there will be less waste than if fed long.

Several members were of opinion that wire netting, with a barb wire above, made the best sheep-proof fence.

Ardrossan, September 28.

Present—Messrs. G. J. W. Freeman (chair), C. Dinham, R. Dinham, C. Cane, J. Henderson, W. Lodge, N. Opie (Hon. Sec.), and one visitor.

SOWING WHEAT.—After a long discussion it was defined that “thin sowing” may be defined as 30lbs. of seed per acre, and “thick sowing” as 60lbs. With a heavy application of manure more seed may be sown. Steinwedel and other early wheats require thick sowing; much, however, depends upon the season. As a general rule it is safest to sow thickly.

Gawler River, September 27.

Present—Messrs. J. Badman (chair), H. Roediger, R. Badcock, D. Humphreys, J. Hillier, E. Winckel, C. Leak, T. P. Parker, F. Roediger, A. Bray (Hon. Sec.), and one visitor.

POULTRY.—Mr. R. Badcock read a paper on this subject to the following effect:—

Breed only from good stock of pure-bred cocks of the undermentioned sorts:—*Jæghorns*, *Minorcas*, *Andalusians*, and *Langshans*. The result will be that the pullets from these will be good layers, if the largest eggs, both white and tinted, are selected. The *Houdan* is also a useful sire to use, and, like the *Langshans*, will, while improving the laying qualities, produce a very fair table bird. Where pullets are desired use two-year-old healthy roosters, mated with at least a dozen young hens. *Indian Game* or *Malays* crossed with *Minorcas*, *Lephorns*, or *Spanish*, produce fine layers and very fair medium-sized table birds. A fine all-round bird results from the *Minorca* rooster and *Langshan* hen, but the former must be of a good bodied type. The pullets from this cross if mated with *Indian Game* or *Malays* produce very good layers or table fowls. When hens are kept for laying only there need be no male birds. The hens lay quite as well without, and the eggs keep much longer. An inferior pure-bred bird is generally of less value than a mongrel. All birds, however well bred, are not necessarily of a good laying strain.

Mr. J. Badman also read a paper on this subject:—

By a large number of farmers there is not that consideration given to poultry that there should be. They are not regarded as a source of income, but as a mere household convenience; consequently poor provision is made for them. Poultry houses are exceptions, and not the rule, the birds having generally to find their own roosts in sheds, on reapers, binders, &c. If hunted out from there they find refuge in trees or pig styes or on straw stacks. They lay their eggs wherever they can find a place, and should you be there before the old crow you will get the egg. A large number die yearly from want of care, and diseases have more than their share owing to the exposed character of the roosts. Success in poultry-keeping depends very much upon the nature of the premises the fowls are to inhabit. They cannot, any more than human beings, retain health and condition without properly-constructed dwellings.

Where possible an eastern aspect should be secured for the house and yard. The perches should be low, from 12 in. to 20 in. high, and about 3 in. wide, swinging from the roof or on metal standards. They should be made from wood, so that the birds can grip, and are not cold. The nests should be arranged so that the birds cannot sit on the edge and foul them; preferably on the ground. The floors must be kept clean. A warm winter house means winter eggs, and a cold one means no eggs and sickness and probable death. Many persons who have every requisite for success fail to make poultry profitable because their stock is not adapted to their circumstances or the purpose intended. Were all fowls alike in their characteristics this, of course, would not occur, but the very fact that so many breeds have been developed and perpetuated by the art of man, differing in every conceivable quality as well as in every point of appearance, proves the necessity of considering the special requirements before the fowls are chosen which are to supply them. There is a very popular error that mongrels, or common fowls, will surpass any pure breeds as regards useful qualities. The idea doubtless grew out of the excess of the poultry mania. There are certain breeds which can always be used to improve the quality of farm poultry. It must be noted, however, that while some breeds tend to increase the size of birds and improve the quality of their flesh, the egg yield may diminish. Others, again, will improve the laying qualities of the resulting progeny, and at the same time decrease their value as table birds. There are certain sorts which can be recommended as all-round farmers' fowls, but it must be remembered that a first-class layer and table bird is not the usual combination. For the production of eggs they may be taken in the following order:—Minorcas, Leghorns, Andalusians, Black Spanish, and Hamburgs. Male birds of these strains mated with selected barn-door sorts will produce pullets which will give increased returns. The progeny of such birds cannot claim to rank as table fowls. In speaking of table poultry I refer to a higher standard than contents the average farmer. There is a demand for table poultry. A good cross is Brahma and Dorkings. The object of such crosses is to get size, hardiness, and easy rearing. The Dorking and Houdan also make an excellent cross, keeping the pouter's five claims well in sight. Of the other kinds the Langshan is hardy and stamps its character on its progeny, no matter what the cross may be. As layers Langshans are excellent, especially during the winter months, and as table birds they are also very good. Crossed with Indian Game or Dorking a very large quick-growing bird results, which carries a large amount of well-placed white meat and has a white skin. Crossed with Minorca a grand all round fowl results, a good layer and a quick-growing table fowl of very fair quality. The Malay are rather long in the legs, but crossed with heavy fowls give good offspring, which are very hardy. I only advocate first crosses, which will give quality, and this is a most important factor. The birds should be plump, shapely, fine in quality, with white flesh and skin, young, and in good condition. The main secret in breeding for the table is to obtain chickens which mature quickly. Long-legged, slow-growing sorts are neither suitable nor profitable. First crosses from mating an Indian Game or an old English Game cock with Langshans, Plymouth Rocks, Cochins, and other heavy breeds are excellent in every way, being fine in quality, plump, and shapely. Some people when a hen begins, have a notion of how to force her to lay without ceasing, and as eggs cannot be produced from nothing they conclude that the more food the more eggs; but that is the rock upon which many are wrecked, for the forcing process does not limit its operations in any direction. In forcing the hen for eggs she is made to do what we do not want her to do. She may be forced to become too fat or diseased, and be utterly worthless. Her capacity is limited, and when compelled to go beyond that capacity she breaks down entirely. There is but one really good method of forcing a hen to lay, and that is by making her scratch and work for her food. She should have all she requires, but should earn it by hard work. By this means you will force her to have a good appetite, to keep warm, to throw off disease, and to rest well on the roost, and in that manner force her to lay. If you wish to break hens from sitting do not drench them in water or put them in a barrel with an inch or two of water in the bottom, nor tie them up by one leg to a tree, nor resort to any of those cruel practices our fathers in their ignorance did to quench the natural instinct. Take them from the nest, put them in a large coop in the open air, under a shady tree if the weather is warm, and feed them with everything that you give to your laying hens. In many cases the fowl begins to sit when she is in good condition to keep on laying eggs. She needs, perhaps, the material for egg shells, which should be supplied. She should not be put in a small coop where she will sit down and take no exercise. It would be better to put her in a pen having loose earth, where she may scratch for a living. Activity will tend to forgetfulness. Social activity should also be provided, and to this end a cock may be introduced to a pen where sitting hens are kept. The best returns in the various circumstances referred to will usually depend upon the character of the management. If an owner simply leaves his fowls to pot luck the results cannot be satisfactory, but if he cares for and studies them the results will be different. To be successful in poultry-keeping there are three essentials—proper accommodation, proper selection, and proper feeding. Poultry treated rightly are the most profitable of all live stock.

Mr. Parker found the Langshans the best breed, proving excellent layers. Minorcas were also good layers, but poor sitters. Members agreed that the rooster should not be kept for more than two years. Mr. Badman favored

house of galvanized iron; they could be cleansed by fire if necessary. Chicks should be raised all the year round to keep up a continuous supply of eggs. Mr. Parker thought chicks were best raised in July; for ticks he found dipping the fowl in a decoction of a stick of tobacco to 2galls. of water most effectual. Care must be taken not to immerse the head, as this would prove fatal. For birds affected with swollen heads and eyes, bath with solution of 4ozs. bluestone in 4galls. of water.

Nantawarra, October 23.

Present—Messrs. Jas. Nicholls (chair), A. L. Greenshields, S. Sleep, E. Pridham, T. Dixon, G. Belling, R. Nicholls, E. J. Herbert, A. F. Herbert, J. W. Dall, H. J. Spencer (Hon. Sec.), and one visitor.

WHEAT DISEASES.—Mr. Sleep tabled specimens of what members described as “takeall” and “black rust.” The wheat was shown to have been planted about 1½ in. deeper than it should have been, and not thickly, only half a bushel per acre being sown. Mr. Sleep wished to know whether one kind of wheat was more subject to the disease than another. Members thought dry seeding conducive to this trouble. [What is the disease—takeall or black rust? It has often been stated that some kinds of wheat are more subject than others to the latter trouble.—GEN. SEC.]

HAYMAKING.—In answer to question as to how many acres of hay—1 ton to the acre, raked in rows—could a man cock in a fair day's work, members were of opinion that, properly done, six or seven acres would be good work.

SHEEP.—Mr. R. Nicholls read a paper on “Will it Pay to Keep Sheep Only?”—

We will take a farm of, say, 1,000 acres, for that I suppose would represent the average holding in this district. It is generally conceded by those who have kept sheep that the carrying capacity of our land is about two acres to one sheep, but when we consider that the keeping of sheep around here has been confined almost exclusively to the recent dry years I think that we might safely say that with judicious management the land would carry a little more; hence if ewes are kept we might say that for four months of the year, viz., until the lambs are ready for market, 80 per cent. of lambs might also be kept. See how this would work out; 1,000 acres of land stocked with 500 ewes should produce (each ewe cutting 6½lbs. wool) 3,250lbs. wool; this at 6d. per pound would mean £81 5s. Eighty per cent. of lambs would mean 400 lambs, which at 4 months should realise 10s. each or a total of £200, making a grand total of wool and lambs of £281 5s. from the 1,000 acres of land. In making the above estimate I have been careful not to exceed the amount of wool each ewe should cut; in fact, I consider that over and above the 6½lbs. there should be ample to pay for the shearing. I have also not taken into consideration the fact that dry ewes might often be sold to considerable advantage as fats at certain times of the year, nor have I taken into account the sale of skins from sheep used on the farm, or meat and fat, which, of course would mean a profit, a profit for instance, such as butchers would make. These might go to provide for small incidental expenses, which would, I think, be well covered. [Such sales, &c., however, would come out of your capital.—GEN. SEC.] For this farm of 1,000 acres the owner would in all probability have to pay £1 15s. per acre or £1,750; this at 5 per cent. would mean £87 10s.; 500 ewes at 8s. per head would cost £200, which at 5 per cent. would mean £10, a total for yearly rental of land at 1s. 9d. per acre and 5 per cent. interest on cost of sheep of £97 10s. The little labor that would be required for the keeping of these sheep, with the exception of shearing, and that I have provided for, the owner of the land—if he were living on his holding—would prefer to do himself, and would, generally speaking, mean a sort of recreation. For this labor, after providing for the cost of land and sheep, the farmer would receive the handsome return of £183 15s. A farm of 1,500 acres could also be worked by the owner if he chose to do so, and should return, after allowing for interest on cost of land and sheep, £280 12s. 6d., a return that would compare very favorably with the individual results of our labor that many of us see at the present time. He contended that keeping sheep on the farm paid, and thought they improved the land they grazed.

Some of the members disagreed with remark that the land was improved by grazing. Mr. Dixon agreed in the main with the paper, but believed a greater return would be obtained by cropping occasionally and manuring heavily with super., instancing the results at the Roseworthy College Farm. Some members

thought a return of 10s. per lamb too high, but Mr. Nicholls said he took the Minister of Agriculture's report on the results obtained from lambs sent through the Produce Dépôt, and reduced the lowest price by 1s. The experience here is that, as a rule, the feed is good the first year after a crop, less the second year, and still less the third and later years, and that the land was best fallowed for a crop the third year. Mr. R. Nicholls has a block of 160 acres, not cropped for seven or eight years, and the feed was splendid, the natural grasses having reappeared.

Bute, October 22.

Present—Messrs. W. A. Hamdorf (chair), W. H. Sharman, E. Ebsary, J. H. Barnes, A. Schroeter, H. Schroeter, F. Trengove, S. Trengove, J. H. Brideson, A. Sharman (Hon. Sec.), and one visitor.

SEASON.—Members were of opinion that, taken as a whole, the crops would be fairly good in this district, the soaking rains of the present month having been their salvation. There have been one or two late frosts, but not sufficient to do much damage. Red rust has made its appearance, but is not doing any serious damage just yet. Hay crops are not of the best, and there will be considerably less cut than last year.

Paskeville, November 26.

Present—Messrs. A. Goodall (chair), A. C. Wehr, J. P. Pontifex, G. Meier, J. C. Price, W. Westphall, W. Curnow, P. A. Blackman, W. S. O'Grady (Hon. Sec.), and one visitor.

FIELD TRIAL.—Committee reported that preliminary arrangements in connection with the trial of harvesting machinery, to be held near Paskeville early in December, were progressing satisfactorily. An early crop belonging to Mr. Train, and within half a mile of the township, had been promised for the trial, the date of which would be fixed as soon as the condition of the crop allowed.

STRANGLES.—This complaint was reported to be very prevalent in the district, and several horses have died from it. The Chairman suggested fomentations at the nose; other members advised poulticing. Members would be glad to know how to secure effectual relief from the complaint. [Nurse the horses well, give soft food, and avoid over-doctoring. Steam the nose by means of nosebag containing hot bran upon which a few drops of carbolic or eucalyptus oil are poured. If the throat is bad foment it; allow the animal plenty of warm water, and give a little nitrate of potash occasionally in the water. If the lump is hard it may be necessary to lance it when ripe.—GEN. SEC.]

WEAKNESS IN FOALS.—Mr. Meier stated that for three successive years the foals from one of his mares became peculiarly affected. Though born apparently sound and healthy, after a few weeks they became stiff, the legs swollen and heated as if foundered. After a time the swelling is confined to special parts, usually the fleshy parts of the thigh. &c.; these fester and break, giving off large quantities of pus. When the foal reaches the age of three or four months it recovers, and as a yearling all trace of the trouble has disappeared. The mare is in first-class condition, and is a good milker; the foal is very fat. Mr. Meier had worked the mare and kept her on poorer feed with beneficial results to the foal. [The feed the mare has is evidently the cause; possibly it is lacking in iron and phosphates. Supplying these constituents in the food of the mare from a few days after foaling may prevent similar trouble in the future, as her milk would be benefited.—GEN. SEC.]

BURNING STUBBLE.—Some discussion took place on the question of burning stubble or ploughing it under. Mr. J. C. Price advocated ploughing it under as early as possible to rot it and thus manure the ground. Most of the members favored burning, as the rainfall was too light and the soil too porous to secure the proper decay of the stubble if ploughed under, resulting in the soil being kept too open, while the rubbish would make it more difficult to work the land, as it would clog the implements.

Yorke town, October 19.

Present—Messrs. J. Koth (chair), C. Domaschenz, A. E. Anderson, and J. Davey (Hon. Sec.).

BLACK AND RED RUST.—Mr. Domaschenz stated that on going through a paddock of wheat which was sown when the land was dry he noticed there was a lot of black rust in it. He could not find any on the land sown when fairly moist. There was a little red rust showing in the crop.

Lucindale, October 26.

Present—Messrs. A. Dow (chair), E. Hall, A. Carmichael, G. C. Napier, A. Matheson, E. E. Dutton (Hon. Sec.), and four visitors.

CURRENT-GROWING.—The Hon. Secretary read paper on "Currant-growing in the South-East," written by Mr. S. Tavender, of which the following is the substance:—

The first consideration is the soil. A good soil for currant-growing is the red loam over clay and limestone rubble, of which there are thousands of acres in the South-East, and there is scarcely a holding in the Lucindale district but has some acres of it. All timber should be pulled down and burned on the ground, as, in my opinion, we are somewhat deficient in potash, and the burning of the timber may supply some. The land after being thoroughly cleared should be ploughed, first with an ordinary single-furrow plough as deep as it will go, then follow in the same furrow with another single-furrow plough, minus the mould-board, as deeply buried as it will work. Small holes should be dug not more than 1ft. deep and 15ft. apart each way; if the soil is deep and good they would do at 12ft. each way. In planting see that your rows are straight—viewed from any vine in any direction—a very important item for the after cultivation. If cuttings are planted, and I prefer them, there is no need for digging holes, as the crowbar hole is sufficient; but two cuttings should be put in where one vine is required, so as to have two chances of successful striking. Care should be taken in ordering rooted vines, or in getting cuttings, to get all Zante currants from a reliable source, so as not to have any mixture. All currant vines require to be trellised in some form or other. I have seen, in the Angaston district, posts only 2ft. high with two wires as a trellis—this may have its advantages; I have seen others 5ft. high with three wires—a very good style; and others 5ft. high with a crosspiece on top of the posts and a wire on each side standing out a foot from the posts and, of course, wires in the posts. This latter is the most favored style in other parts of the State, but I prefer a single post at each vine 6ft. high, or a little less, with one stout wire through the top. A post is put at the exact spot where the vine is required. Two shoots from the vine can be run up this post and one carried each side of the post. The great advantage of this style is that cross cultivation can be done, as the horse can walk under the one wire up till the time that shoots get long enough to hang down, by which time the cultivation will be finished for the year. The cultivation should be—Twice ploughing every other year. In July; strike a crown in the middle of each row and plough back from the vines a depth of 4in. or 6in. and left rough until September; then harrow smooth and plough again; the furrow to be turned up to the vines this time and left rough for a harrowing later if required. The next year cultivating three or four times with a horse-hoe will be sufficient to keep the ground loose and kill the weeds. The first time the narrow steels (on a "Planet, jun.," or "Iron Age" horse hoe) should be used; then the work should be done with the "scarifier" or "sweep" feet that can be had with these implements. It is necessary, as a preventive, to sulphur the vines at least twice a year, as fungus diseases seem to be quite at their best in the South-East, owing no doubt to the moist climate. The first sulphuring should be done when the shoots are about 6in. long, say, in October, and the second just after the "bloom." Sulphur all the

young shoots and foliage very liberally. Zante currant vines are supposed to not "be in full bearing" until seven years of age, but in the shallow soil on limestone rubble they come in much younger. The fruit should be quite ripe before being picked; but in this district the picking should be done as soon as possible, so as to get the full benefit of the sun for drying. Dry on wooden trays in the sun, unless the quantity grown would warrant the building of ovens for drying purposes, which I venture to predict will be an accomplished fact in the not distant future. Stack the trays at night or in wet weather and cover with a short sheet of iron, which will make a rain-proof stack. One great advantage of small trays is that with one spare tray two can easily turn the fruit, if required, by placing the spare tray on top of the full one, and, with a quick turn of the hands, the full one is emptied into the spare one upside down and a spare one in hand for the next, and so on. The drying here, when the sun is not what is desired for the purpose, is oftentimes a tedious operation, and to any who are lacking in the virtue of patience my advice is do not go into currant-growing in the South-East. A skeleton frame made with a few pieces of deal batten for these trays to slide into a few inches apart, after the drying season is over, makes a very convenient rack for storing pears or other soft fruits that require laying out singly. When the currants are quite dry the large stems should be picked out and the fruit can be bagged or boxed ready for winnowing, which should be done on a fine warm day, so that the stems will easily liberate and blow out. The fruit is then ready to bag or box. I prefer the latter, as the fruit sweats and *evens* up better in boxes.

Strathalbyn, October 21.

Present—Messrs. M. Rankine (chair), D. Gooch, W. M. Rankine, P. McAnaney, R. Watt, and H. H. Butler.

DAIRY INSPECTION.—It was decided that as publicity had been given in the *Journal of Agriculture* to statement by the inspector of dairies at the Bureau Congress that a case of fever had occurred on a dairy farm in this district owned by a member of the district council, this Branch wishes to have further information, as the members had heard nothing of the matter previously. It was resolved that this Branch is in favor of the present system of inspection of dairies.

CONGRESS.—The address given by Professor Lowrie at the recent Congress was fully discussed, and met with the approval of the members.

LEGISLATION.—It was decided that, in the opinion of this Branch, all Branches of the Bureau should be supplied with copies of the Health, Vermin, Stock and Brands, Codlin Moth, Rabbit, and similar Acts, and that the Central Bureau be asked to move in the matter.

Mount Gambier, October 12.

Present—Messrs. W. Mitchell (chair), J. Watson, M. C. Wilson, A. J. Wedd, D. Norman, sen., J. C. Ruwoldt, T. H. Williams, J. Kennedy, T. Edwards, and J. Dyke.

DAIRY INSPECTION.—In answer to question the Chairman stated that he was present when the subject of inspection of dairies was discussed at Congress. A majority of the members present on that occasion were opposed to the appointment of additional inspectors. Mr. Williams said he did not altogether hold with the idea of appointing inspectors; still there were a good number of dairy farms not so clean as they might be, and something might be done by the distribution of circulars bearing on the necessity for cleanliness. More actual harm was caused through dusty yards than from mud, but he admitted the difficulty of preventing dust in the summer.

LOSS OF LAMBS.—Mr. Stock Inspector Williams said a matter of considerable importance to stockowners had come under notice recently. During the recent lamb-marking season he had on four occasions examined lambs that were sick and some that had died, the deaths usually taking place at from seven to

fourteen or fifteen days after marking. These deaths had mostly occurred among wether lambs, and he had found a pus under the scrotum, and also, in one or two cases, where the tail had been removed from the ewe lamb. Septic poisoning followed from the colonies growing in the pus, and these, passing into the system, caused death. In a number of instances he examined the stones on which the knives were sharpened, and there found millions of organisms identical with the colonies in the pus on the lambs. This would show the great necessity for absolute cleanliness in lamb-marking. He would advise the use of an antiseptic, such as one of the fluid sheep dips, in which to frequently wash the knives and stones. By the adoption of this precaution all organisms collected on either would be effectually destroyed. The symptoms of the trouble in lambs were usually paralysis across the back or rigidity of the limbs, and sometimes it was noticed in the form of tetanus. During his recent examination he found that two owners, living some distance apart, lost lambs, and he learned that one had borrowed the knife stones from the other.

FERTILISERS.—The Chairman remarked on the beneficial effect of the commercial fertilisers on the crops, as noticed during his recent visit to the North. Other members agreed, and Mr. Ruwoldt stated that even on his land he was getting double the crops from the manured portions. The Chairman thought there was not the same necessity for using the manures here, as the stock kept the land in pretty good condition.

WEED.—Mr. Wedd tabled weed growing in the district which was alleged by some people to be poisonous. Mr. Williams expressed his doubts as to poisonous nature of the plants, and agreed to examine the intestines of sheep supposed to be poisoned by it.

Lyndoch, October 23.

Present—Messrs. H. Kennedy (chair), M. Burge, J. M. Sim, H. Springbett, B. Kerr, J. W. Thomas, P. F. Zimmermann, R. Loveridge, and J. Mitchell (Hon. Sec.).

DAIRYING.—The Chairman reported on visit to Mr. A. J. Murray's home-stead at Mount Crawford for the purpose of inspecting the Jersey cattle. The visit proved both interesting and instructive. Mr. Loveridge read a paper on "Dairying," and a lengthy discussion followed.

MANGE ON HORSES.—Members wish to know cure for this complaint. [This depends upon the kind of mange, some cases being very difficult to cure. Wash the affected parts with warm water and soft soap and apply carbolic oil; leave for two or three days and repeat treatment.—GEN. SEC.]

Johnsburg, October 26.

Present—Messrs. G. H. Dunn (chair), L. Chalmers, J. R. Masters, W. McRitchie, P. Caughlan, T. Potter, H. Napper, J. Read, M. L. Read, W. Buchanan, F. W. Hombsch, and T. Johnson (Hon. Sec.).

HORSE COMPLAINT.—Mr. Caughlan read a short paper dealing with complaint amongst horses in this district. By many it was said to be strangles, but he was of a different opinion, as he had never seen aged horses suffer from strangles. The disease seems also to be more painful and fatal if prompt remedies are not applied. He did not doubt that blistering would do good in the early stages, but in advanced cases lancing was the quickest and best. A neighbor had a colt so bad that he could scarcely breathe; he was crippling up with every effort and foaming at the mouth. The head was swollen and in his throat were two lumps. These were both cut—one being quite hard—and

fully a pint of blood and matter escaped. The cuts were washed with lukewarm water and in a short time the animal was so much relieved that he commenced to eat a little chaff. For several days matter ran from the wounds, but the horse went about picking up food. The wounds require attention, but it is best to allow the animal liberty and exercise. The horse was now quite recovered, but all the hair has come off; he had noticed that other horses attacked were also losing their hair and the skin is covered with small lumps. He had seen mange in horses, but this was quite different. Considerable discussion on the matter ensued, some members contending that the complaint was strangles, while others agreed with Mr. Caughlan. The Hon. Secretary had a young mare affected, the throat being much swollen, but she could eat and drink. He called in a veterinary, who proceeded to catch the animal; she moved round the yard once or twice and then dropped dead. The vet. said she had abscesses following influenza, and that she had apparently died from suffocation. Mr. Napper had cured a very bad case by steaming the horse with a decoction of mallee leaves. Mr. Masters had a similar case described as quinsy. The Chairman thought all the cases were strangles; the low state of the horses through the bad season had undoubtedly something to do with the severity of the attacks. He did not approve of steaming, but if done should be in the middle of the day when the temperature was rising and in a close compartment. It would be better to do it in the open than in a draughty paddock. He advocated rubbing the throat with kerosene and turps to soften the skin, and giving plenty of salt in the drinking water. Mr. Hombesch mentioned that medicines could be easily administered to sick horses by mixing to a paste and placing it on the tongue, which should be drawn well out. [These seem like exceptionally bad cases of strangles.—GEN. SEC.]

FEEDING FARM STOCK.—Mr. Masters read the following paper on this subject, which was well discussed:—

If there is one thing more than another that the late drought has taught northern farmers it is the judicious use of feed for stock; and by giving a short paper on the subject farmers in the more favored districts may benefit by what we have learned through dire necessity. While travelling southwards during the winter months I found stock of every description, with very few exceptions, in poor condition; and by what I hear from friends, the same condition of things was noticeable right through the State, while feed was very plentiful on every side, in the fields, hay-yards, and barns. Now, what was the cause of this undesirable state of things? Certainly not want of feed, or the want of feeding, but in many cases over-feeding—too much cramming of horses on hay alone. The general mode of feeding horses where hay is plentiful is to give them as much as they can eat during the time they are not working; and if they are not doing well they are given a little bran with the chaff, to make them eat more, intensifying the evil by still further overloading the horse's stomach, until it is not in a fit condition to go to work. If the horses had been given a much smaller quantity of hay and a little wheat, either crushed, boiled, soaked, or even raw, or a little linseed, or some other nutritious food, they would be far better fitted to do a hard day's work. I am well aware of the fact that the horse's stomach is so constructed that it requires a larger amount of substance than most animals, but not nearly as much as is usually given them. A horse cannot work with its stomach filled to its utmost capacity without injury to its constitution. A horse will consume as much good feed in an hour and a half as it can digest in six hours, so by giving horses one and a half hour's feeding in the morning, the same at midday, and an hour longer at night, the horse will have feeding enough to do any ordinary farm work. I do not advocate stabling horses at night. If there is any shelter in the paddock where horses can get access to, in case of a stormy wet night, the horses will do better roaming about at liberty, and will be waiting with a good appetite for their breakfast. Another cause, I believe, is the growing of too hard solid-strawed wheats for hay, for the reason, I suppose, of its extra weight for sale as chaff; but I would sooner feed horses on cocky chaff with wheat than give them some hay chaff I have seen offered for sale. If horses were poor, milking cows were even worse, and it goes to prove that there was a want of nutriment in all dry feed, such as grass, straw, or stubble. But why was not that nutriment supplied by the owner when there was wheat in the barn and cocky chaff in heaps? Not because it will not pay to feed cows. Some people were feeding their cows on cocky chaff and bran, with very poor results, when if they had given wheat in place of bran, or, better still, wheat with the bran and cocky chaff, they would have been well paid. Now, I do not say that crushed wheat is the best feed that can be obtained for milking cows,

nor do I advocate heavy feeding on wheat when cows are wholly hand-fed, but rather a change of rations to act as an aperient. I fed my milkers very successfully on cocky chaff and crushed wheat for about three months this winter, and for every bushel I used I got a direct return of 6s. in extra butter. I had milk enough to feed all the calves, and my cattle were in better condition when the feed grew. To sum up the whole matter, when feeding working horses give them less hay and chaff and more wheat; give short feeds before going to work, and never over-feed them. When grass fails to keep up your milking cows in their butter production give them wheat also; it will pay you to do it.

Hartley, October 23.

Present—Messrs. J. Stanton (chair), H. Reimers, A. Thiele, T. Jaensch, J. Jaensch, A. Jaensch, W. Klenke, W. Kutzer, W. Cross, and B. Wundersitz (Hon. Sec.).

FODDER FOR MILK COWS.—Paper read at Strathalbyn Branch in August by Mr. J. Cheriton was discussed. It was agreed by the majority of members that fodder for cows was best preserved as ensilage, and that the pit was better than the stack. Ensilage was considered better than hay for the following reasons:—Anything green that stock will eat will do for ensilage, and the ground is cleaned of weeds, thistles, &c., while if left for hay the seeds are scattered all over the fields. Earth on a layer of straw was considered the best covering for stack ensilage. It was agreed that cows give more milk on green feed than on dry, but it is poorer. Mr. Klenke considered wheat chaff and bran better than hay or ensilage and also cheaper. Mr. Thiele said his cows were fond of the cactus (prickly pear) if the thorns are burnt off. Lucern, if fed green, should be allowed to wilt for some time before feeding; otherwise it will taint the milk.

Wilmington, September 30.

Present—Messrs. J. Hutchens (chair), T. Carter, J. Schuppan, J. Lauterback, M. Gray, J. McLeod, and R. G. S. Payne (Hon. Sec.).

DAIRYING.—Mr. Gray reported on proceedings of Annual Congress. Members who have read Mr. Davidson's paper consider his statements too sweeping. Separators were useful and quite essential to farmers who were located several miles from creameries. Members agreed that good sanitary conditions were essential to success. The value of co-operative butter factories was discussed, and the question of the accuracy of cream testers. Some suppliers seemed to think that they did not receive full value for their milk bought by the local factory on the tested contents, but the manager pointed out that there could not be any error here, as the actual yields of butter compared remarkably well with what the tests of the various suppliers' milk indicated.

FERTILISERS FOR WHEAT.—The Hon. Secretary reported having been much struck during a recent inspection of the crops with the difference in the appearance of the manured and unmanured crops. Mr. Schuppan reported that in his experimental plots, being carried out under the supervision of the Inspector of Fertilisers, superphosphate promised much better than Thomas phosphate drilled in with the seed or applied two months previously. Where 1cwt. of super. per acre had been applied the wheat was superior to where only 65lbs. was put on.

INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

Number of Persons Registered and Found Employment by Government Departments and Private Employers from September 28 to October 30, 1901.

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youths	82	126	240
Masons and bricklayers	3	2	1
Carpenters and joiners	7	2	3
Painters	1	1	1
Plumbers and ironworkers, &c.	2	—	1
Blacksmiths and strikers	6	3	1
Boilermakers and assistants	3	—	—
Iron and brass moulders	1	3	—
Fitters and turners, &c.	6	2	2
Compositors	—	—	2
Caretakers and watchmen	—	—	2
Warders	3	—	—
Pipelayers	1	—	—
Camel-driver	—	—	1
Gardener and boots	1	—	1
Apprentices	15	4	1
Porters and junior porters	15	7	1
Rivet boys	1	—	—
Cleaners	10	10	—
Brass finishers and polishers	2	—	—
Carriage trimmers	1	—	—
Farm hands	—	—	2
Cook	—	—	1
Totals	160	160	260

November 1, 1901.

A. RICHARDSON, Bureau Clerk.

The Factories Acts.

CONTRIBUTED BY CHIEF INSPECTOR BANNIGAN.

(Continued from page 308.)

Every person who shall employ any woman, young person, or child in contravention of the provisions of the Act, and every parent who shall permit or suffer any young person or child to be employed in contravention of the provisions of the Act shall be deemed to have committed a breach of the Act.

Every order, requisition, or determination made by the Inspector shall be in writing, and served on the occupier.

All offences against the Act, or against any regulations made under the Act, in respect of which offences any fine or penalty is by the Act imposed, shall be heard and determined, and such fines and penalties shall be awarded and imposed, in a summary way by and before any Special Magistrate or any two or more Justices of the Peace for the said province.

All the proceedings before Special Magistrates or Justices shall be regulated by Ordinance No. 6 of 1850, the Justices Procedure Amendment Act 298 of 1883-4, and any other Act that may be law in that behalf.

Every person who forges or counterfeits any certificate of appointment, or makes use of any forged, counterfeited, or false certificate, or falsely pretends to be an inspector under the Act, shall be liable to be imprisoned for a period not exceeding six months with or without hard labor.

There shall be an appeal from any order of any Special Magistrate or Justices made under the provisions herein contained, and from any conviction by any Special Magistrate or Justices for any offence against the Act, and from any order dismissing any information or complaint under the Act, which appeal shall be to the Local Court of Adelaide of Full Jurisdiction only, and the proceedings in such appeal shall be conducted in manner appointed by the said Ordinance No. 6 of 1850, and the said Act No. 298 of 1883-4, for appeals to Local Courts; but the Local Court of Adelaide aforesaid may make such order as to payment of the costs of such appeals as the Court shall think fit.

The Local Court, upon the hearing of any appeal, may state one or more special case or cases for the opinion of the Supreme Court, and the Supreme Court shall hear and decide such special case or cases according to the practice of the Supreme Court on special cases, and the Supreme Court shall make such order as to costs of any special case as to the said Court shall appear just; and the Local Court shall make an order in respect to the matters referred to the Supreme Court in conformity with the certificate of the said Supreme Court, which order of the Local Court shall be enforceable in manner provided for the enforcement of orders of Justices under the said Ordinance No. 6 of 1850, or other Act as aforesaid, and, save as herein provided, no order or proceeding of any Local Court made under the authority of the Act shall be appealed against or removed, by *certiorari* or otherwise, into the Supreme Court.

The Special Magistrate or Justices imposing any penalty under the Act may direct the whole or any part thereof to be applied in or towards payment of the costs of the proceedings; and, subject to such directions, all penalties shall be paid to the Treasurer for the public use of the province.

The Governor is empowered to make and issue regulations, not inconsistent with and subject to the provisions of the Act, for the more effectual carrying into effect the objects and purposes of the Act.

All such regulations shall be laid before both Houses of Parliament within fourteen days from the making thereof, if Parliament is then in session, and, if not, then within fourteen days after the commencement of the next session.

All such regulations shall afterwards be published in the *South Australian Government Gazette*, and shall take effect from the date of such publication unless otherwise provided in such regulations; and in all legal proceedings the production of the *Gazette* containing any such regulations shall of itself be sufficient *prima facie* evidence that such regulations have been duly made. No regulation which shall be disapproved of by either House of Parliament shall continue to have any force or effect, notwithstanding any publication as aforesaid.

If a factory is not kept in conformity with the Act or of the regulations thereunder, or if in any factory there is a breach of any of the provisions of the Act, or of the regulations thereunder, or if the occupier of a factory or other person fails to comply with any provision of the Act, or with any order or request made by the Minister or an inspector in pursuance of this Act or regulations, the occupier or other person shall on conviction, if no other penalty is provided, be liable to a penalty not exceeding £10. The magistrate or justices, in addition to or instead of inflicting a penalty, may order certain means to be

adopted by the occupier within some time to be named in the order for the purpose of bringing his factory into conformity with the Act, and may upon application enlarge the time so named; and if, after the expiration of the time originally named, or enlarged upon subsequent application, the order is not complied with, the occupier shall be liable to a penalty not exceeding £1 for every day that such non-compliance continues.

In all proceedings taken against any person for any breach of the Act, or of any regulations to be made thereunder, the following provisions shall have effect:—

- I. The onus of proof that articles prepared or manufactured or made for sale shall in all cases be on the defendant:
- II. In any proceedings against any person for employing within any factory any apprentices or improvers in excess of the number or proportionate number, as determined by a Board, the onus of proof that the provisions of the Act and of such determination with regard to the number or proportionate number of apprentices or improvers, or of apprentices and improvers (as the case may be), who may be employed within such factory have been complied with shall in all cases be on the defendant:
- III. The onus of proof that the person named in a summons as an employé of the defendant in a certain capacity was not employed in the capacity named in such summons shall in all cases be on the defendant:
- IV. In any proceedings against the occupier of a factory for employing any person in excess of the hours of employment permitted by the Act the contents of the notice affixed by the occupier containing the holidays and working hours of the factory shall be conclusive evidence of the facts therein stated.

All informations or proceedings for a breach of the provisions of Part II. of the Act of 1900, or any regulations thereunder, shall be laid or taken by or on behalf of the Board.



Journal of Agriculture

AND

Industry.

No. 5. REGISTERED AS]

DECEMBER, 1901.

[A NEWSPAPER.

VOL. V.

NOTES AND COMMENTS.

Taken on the whole the weather during November has been cooler than usual, and a fair amount of cool and showery weather has been experienced. In some cases the later crops have benefited, but, on the other hand, "red rust" has found congenial conditions. In our previous issue we expressed our fear that the unusually moist October would cause the rust to spread, and reports from country correspondents show that these fears have been realised. In many cases rust has completely ruined promising crops, and thousands of acres have been cut for hay that, but for the appearance of rust, would have been left for wheat. This will, of course, reduce our average yield considerably; and while it is yet too early for anything like a fair estimate of the total yield, there is little doubt that it will be below last year's. Reports indicate that, taken as a whole, the grain will be of good quality. Reaping is now general in the Northern and Western districts, the weather conditions being favorable.

While it is yet too early to form any estimate of the damage done to our wheat crops by "red rust," it is now well known that the damage is very serious in some localities. In many instances farmers cut their crops for hay as soon as they found rust to be present on the flag. By some this action has been looked upon as precipitate, they being of opinion that the grain would have escaped injury; but, on the other hand, some farmers who left their wheat find that not only is the grain destroyed, but the straw is absolutely rotten and useless for anything. Where rust exists in a crop the farmer must exercise his own judgment as to cutting it, and he will doubtless give every consideration to the fact that by making it into hay he is certain of some return, whereas by leaving it for wheat he may get nothing at all.

South Australia has not suffered severely from the ravages of red rust for a number of years, and there is little doubt that freedom from rust has caused less attention being given to the growing of rust-resisting varieties of wheat. To what extent the so-called "rust-resistant" wheats have escaped injury is not yet apparent, but the experience of previous years shows that it is possible to raise "rust-resistant" wheats that yield well, and are of good milling quality.

The present season's experience will doubtless be the subject of much discussion amongst farmers, and will lead to renewal of the efforts to improve our wheats. Some wheats seem peculiarly susceptible to rust, while others are nearly free, the injuries being confined almost entirely to the flag. Most of these latter are not wheats of good milling qualities, but by careful selection and cross-breeding they can be greatly improved in this respect.

The House of Assembly has passed the following resolution :—" That in the opinion of this House it is desirable that a sum be placed upon the Estimates for the purpose of carrying out experimental plots for the cultivation of cereals, etc., in various parts of the State, such sum to be expended where practicable under the direction of the Agricultural Bureau." The Hon. Minister of Agriculture has intimated that £200 will be placed on the Estimates for the current year for the purpose of carrying out experiments in the direction indicated. No decision has yet been arrived at as to how this money is to be spent, but the co-operation of the members of the Bureau will doubtless be sought in the practical part of the work. It has been suggested by some that instead of the work being done by farmers the department should establish small experiment stations in several districts, but it would not be possible to do this without a vote of £300 or more for each station.

The question with farmers should be not so much as to which varieties of wheats are of the best milling quality, but which sorts will return them the most money for their labor. There are wheats that are early, or hardy, or rust-resistant, or least liable to shake out when the seed is ripe. Some are far more prolific than others; some are softer and produce a whiter flour than others; some have more gluten, and that of better quality, than others, and farmers want to know which varieties possess the greatest number of the good points. They want the highest reliable cash returns per acre first, and next they require the qualities that will secure the approval of all purchasers. White bread looks nice; but brown bread is often of better quality. Still if the wheats that will produce white bread are also the most prolific, hardy, reliable, and profitable to grow, then the millers should be studied; but the farmer should study his own interest in the first place, and look out for the prejudices of the millers afterwards.

The *Nebraska Farmer*, of September 19, 1901, deplors the sinful waste of straw on many farms, and says hundreds of thousands of tons of beautiful bright straw, of excellent feeding quality, are lying on the farms without any reference to stacking or preservation, to rot and spoil, while the cry is coming from almost every State that there is a shortage of hay. Further on it says that cattle can be wintered on straw alone where they have access to water and good shed protection. The importance of water and shed is a consideration in the economical use of straw as a winter feed. With a small grain ration added to a liberal supply of straw, fed in cribs or racks, cattle are cheaply and successfully wintered.

The *Nebraska Farmer* continues in the same article:—"The wintering of 100 or 200 head of cattle on the majority of the grain-raising farms of Nebraska, where the entire outlay of feed would consist of the straw and fodder products of the farm crops would be an easy proposition and add \$300 to \$600 to the annual farm income, besides adding several hundred dollars to the fertility of the farm by having these waste products consumed on the farm. The fertilising value of the straw crop, considered alone, is of sufficient importance to demand its preservation in some form that will result in its return to the land as a manure. The burning of the straw on the farm is an agricultural crime. It is robbing the land of the elements of life and fertility that in the course of nature belongs to it. It is taking out of the possible farm revenue of this State alone millions of dollars annually. It is a needless waste, and the time is not far distant when careless and unmethodical management on the farm must give way to system and economy."

Commissioner Russell hit the centre of the target when he fired that shot at the folly of the farmers in their continued fight against fate in the far north. No one can farm profitably, or even make bare subsistence on land where the average rainfall does not exceed 8 in. yearly. It is nonsense to talk about "British pluck" and "indomitable courage" in connection with this continuous occupation of country subject to perennial drought. The same sort of "courage" is possessed by certain insects called "ants," which are equally industrious and persevering, and do not hesitate to attack the largest animals that walk the earth, with the idea that they will be able singly to conquer the monster and drag it home for food. The only sensible thing those "distressed" farmers can do is to abandon the north and take up farms within the limits of decent rainfall, and they might be helped in doing this, and the assistance would be more rationally applied than providing seed and subsist to enable them to have another "go" at the elephant.

The West Australian Department of Agriculture reports that their officers have frequently found the cherry slug and plum curculio in cherries and plums sent from South Australia. As these two insects have never been found by South Australian growers or orchardists, and as absolutely no injury is caused here by them, we are forced to the conclusion that it is either another case of mistaken identity on the part of the West Australian officials, or that in South Australia these terribly destructive pests possess the power to render themselves invisible. Most people will believe the first to be the correct supposition. In connection with this matter it would be interesting to inquire, first whether the plum curculio has ever been recorded in Australia, and second whether the cherry slug usually attacks the fruit of the cherry.

Parasites of the codlin moth are known to exist in various parts of the world, but there are none known that have any real value in keeping the codlin moth in subjection. Not very long since Mr. Boucher, one of the fruit experts of the New Zealand Department of Agriculture, discovered a small fly which appears, whilst in the larvæ stage, to prey upon the eggs of the codlin moth, and specimens of the fly were sent to America, and identified as being similar to one known there to possess the same habit. Of course it is to be understood that a "parasite"

is an animal or a plant which can only exist by living upon the vital juices or tissues of other animals or plants, such as fleas, lice, intestinal worms, hydatids, etc., amongst animals, and mistletoe, red rust, shothole, &c., amongst plants. Therefore a spider, centipede, or other insect-devouring animal would not be a parasite. Unless this New Zealand fly lays eggs on the body of the caterpillars of the codlin moth, and these develop larvæ which enter the body and mature there, it is not a parasite, but is simply a predaceous insect like the wasp.

Rev. E. H. Thompson, Franklin, Tasmania, writes that "black spot" of apples (*Fusicladium dendriticum*), is now no longer feared in that State, because its effects can be prevented by spraying with Bordeaux mixture just when the apple blossoms are coming out. Where orchardists fail to spray for a season or two they suffer, and it takes more than one season of spraying afterwards to bring the disease into subjection. Mr. Thompson does not agree with the latest formula, which increases the proportion of bluestone and decreases the quantity of lime. [It would be better to use a small quantity of sugar, molasses, or old honey, and increase the quantity of lime, as recommended by the General Secretary several years ago. It is pleasant to hear that the Tasmanians have at last proved South Australian practice right with regard to "black spot."—EDITOR.]

Rev. E. H. Thompson, of Franklin, Tasmania, is desirous to arrange an inter-State committee for the purpose of securing a universal correct nomenclature of fruit, commencing with apples, the names of which are most deplorably mixed. This is no subject for neglect, because the apple export business is a very large and rapidly increasing one. Where we find an apple with six different names, each name belonging by right to another apple, which also possesses several aliases belonging to other apples, the difficulty of knowing which is one and which is the other is one not easily got over. What is everybody's business, however, is nobody's business—unless Mr. Thompson, or some other patriotic person, takes the matter in hand and carries the work to a conclusion. When this happy consummation has been arrived at there will be many who will try to claim the credit of having done the work.

Many people complain that they experience great difficulty in getting saltbush seed to germinate. Mr. E. French, Hon. Secretary Morgan Agricultural Bureau, states that he gave a packet of saltbush seed to a gentleman who steeped them in hot water for a short time before sowing, and they germinated in less than a week. Mr. French states that he has heard of this being done before, and it should be tried by those attempting to raise saltbush.

A matter of considerable importance to exporters of butter is the temperature at which butter is carried to England. After a number of years' experience, New Zealand shippers found butter carried best at under 20° F., and now insist on the chambers being kept at about 15° F. In the recent butter competition in New South Wales the exhibits were divided into two parts, one being kept at 28° to 30° F., and the other in a room at 18° to 20° F., and the judges in

their report state that one would hardly believe that the two lots were the same butters when they had been kept for two months. Those held in the colder chamber were in most cases ten points better in flavor than the other. Experiments in keeping butter at low temperatures were to have been carried out by our Dairy Instructor during the past winter, but as the depôt at Port Adelaide was not working nothing could be done.

A short time ago a farmer near Tickera forwarded to the Agricultural Bureau office several grubs (called "worms") taken from some flour. He did not state whether the flour came from America or elsewhere; but the grubs, according to Mr. J. G. O. Tepper, appear to closely resemble the larvæ of *Tribolium confusum*, a flour beetle which appeared suddenly in many American flour mills and warehouses, and caused enormous losses. The various flour beetles and meal worms, in their mature form, are sometimes large, and the larvæ or grubs of some species reach 1 in. in length (being prized by fishermen as bait), but the mature beetle of *Tribolium* is about $\frac{1}{2}$ in. long, and its grub—called a "worm"—is about $\frac{1}{4}$ in. long.

It is remarkable that South Australians prefer leathery, highly-colored, indigestible cheese and dyed butter to the wholesome white, slowly-matured, and easily-digested article, such as is used almost universally in Europe. It is almost impossible to purchase butter that has not been dyed with "coloring" varying from palest primrose to brightest yellow; and, as for cheese, it can be found in tints up to red. It is said that cheese is scarce, and that the curd must be cooked at a high temperature, so that the cheese may be quickly ready for market—and then it is sold only partly mature. There is opening for the marketing of something better than what is here called "Cheddar." Our Dairy Instructor would certainly be willing to demonstrate practically how to make good Stilton, Gloster, Brie, Neufchatel, Limburg—No, let us stop at that!

Catalpa speciosa is a useful tree for its straight, light, compact, durable timber, good for many purposes. It reaches a height of 80 ft., and grows quickly. The timber is of a straw color, and takes a good polish. Amongst other uses the timber is used in America for railway ties, which last thirty-five years. The *Catalpa* will thrive in the hilly districts, and fair specimens may be seen on the East Park Lands of Adelaide; but they do not thrive so well there as in the hilly districts.

There is no room for doubt that there is a lot of money to be gained by the various Australasian States through extensive planting of forest trees and the judicious conservation of existing forests. This work cannot well be taken in hand by private individuals or by companies, because the first returns cannot be received for many years to come—in fact, scarcely within an ordinary lifetime. Our so-called Ninety-mile Desert, for instance, within sixty years from now, if it were covered with pines and other useful trees, would afford profitable employment to thousands of people, and bring in a large revenue to the State coffers. True statesmanship regards the future interests of the people with quite as much solicitude as it looks to the present necessities of the populace.

THE PRODUCTION OF PHOSPHATES.

The *American Fertiliser* furnishes some interesting figures concerning the production of crude phosphates and the demand for fertilisers throughout the world for the year ending August 31, 1901.

The various forms of rock phosphate required to supply the world's demand amounted to, in round numbers, 3,000,000 tons. Europe requires nearly 2,000,000 tons, and America 1,000,000. The principal sources of supply are :—

	Tons.
Russia and Norway	50,000
Belgium	300,000
France	400,000
Africa	400,000
America	1,850,000
Total	3,000,000

America produces more than one-half the total supply, and this comes mainly from three States, which last year produced the following quantities :— Florida, 803,099 tons; Tennessee, 446,085 tons; and South Carolina, 327,768 tons. Several other States produced smaller quantities, and new discoveries are being opened up every day.

Of the American States, Florida is easily first in the total production, and it is stated that nearly £5,000,000 is invested in the phosphate mining industry. Four classes of phosphates are found here, viz., soft rock, hard rock, river pebble, and land pebble. All are of good uniform quality, ranging from 60 per cent. to 85 per cent. of phosphate of lime, and the output appears to be limited only by the demand and price. Tennessee has come to the front quite recently; in 1894 only 4,841 tons of phosphate were produced, while in 1899 it reached 486,886 tons. South Carolina, on the other hand, is going down to a considerable extent. In Canada large deposits of phosphates in the form of apatite are found; these are of high quality, but cannot compete in price with the mines of Florida, Tennessee, and South Carolina. The deposits on Christmas Island are reported to be very extensive, and discoveries are reported from Egypt, Palestine, and elsewhere, so that notwithstanding the enormous consumption, it would appear that the supplies at present proved to exist will supply the demands of the world for a good many years.

The production of Thomas phosphate (basic slag) for 1900, is placed as follows :—

	Tons.
Germany	786,000
Great Britain	256,000
France	198,000
Belgium	112,000
Austria Hungary	64,000
Total	1,416,000

For 1901, the consumption is estimated to reach 2,000,000 tons. It will be seen that in these two forms of phosphate the annual consumption of fertilisers throughout the world reaches a very high total. Roughly speaking, a ton of high-grade rock phosphate will make 2 tons of mineral super, so the total referred to previously is equivalent to nearly 6,000,000 tons of fertilisers, and with the Thomas phosphate we have a combined total of between seven and eight millions of tons consumed in one year. Besides these two forms, many hundreds of thousands of tons of guano, bonedust, and other by-products of abattoirs, &c., are used annually.

DESTRUCTION OF PRICKLY PEAR.

The different varieties of *Opuntia* (prickly pear) have been at various times recommended for planting in dry districts for fodder purposes, hedge plants, and breakwinds. In many parts these plants are regularly used as food for cattle, the spines being removed by various means, principally scorching by fire. In Algeria and Tunis the plants are grown for their fruits, which are large and well-flavored. A thornless variety is also being grown, and may be largely utilised in the future for planting as a standby for stock in arid regions. On the other hand, however, the prickly pear in many countries, particularly in sub-tropical localities, becomes a curse to landowners, taking possession of acres of valuable land to the exclusion of both man and beast. In New South Wales and Queensland thousands of acres are occupied by this plant, and considerable expense has been incurred in attempting to eradicate it. Immense difficulties have beset landowners owing to the impossibility of burning the plants, and to the fact that a leaf falling on the ground will take root and grow.

The Queensland Department of Agriculture took the matter up some time since, and has been carrying out experiments in destroying the pear, with very satisfactory results. A steep hillside, thickly strewn with volcanic soil, and in many places exceedingly rocky, was selected, being covered with prickly pear of strong dense growth and mostly of great height. The area of the hill is about 145 acres, and the result of the work is that, with the exception of about an acre which remains to be cleared, there is a dense luxuriant growth of grass. The agent of destruction is *Sodium arsenite*, made by boiling 4lbs. white arsenic and 3lbs. washing soda in 1gall. of water for half an hour, stirring well; 5oz. of this solution is added to a gallon of water when used. After several small experiments, more or less successful, it was decided to cut down and spray the pear with the arsenite of soda mixture. To protect the men from the thorns, &c., they were provided with leather leggings reaching to the thighs. Special mattocks with narrow blade about 2ins. wide and 6ins. long, one end being for cutting and the other for chipping, were made, and being light were easily handled. The pear is chopped to the ground, the thickest leaves and stems being slashed with the mattocks, and the stump torn to shreds, but not extracted. With a knapsack spray-pump the leaves are thoroughly wetted with the poison, the stump being similarly treated. In three to four days the leaves wilt and turn brown, and soon dry up until they crack like pea or bean pods. Not only are the tops destroyed, but the spray has penetrated to the ends of the long roots, destroying them completely and converting them to a rich humus. The whole area is now a valuable grazing property, producing abundance of succulent grass, wild carrot, and other herbs. Contrary to expectation, the grass had not been injured; it appears rather to have been invigorated, possibly by the decaying vegetation.

CRYSTALLISED FRUITS.

The manufacture of these sweetmeats is quite a simple matter, coming easily within the capabilities of the ordinarily clever housewife, while the expense of preparing them is small. Of the various fruits best adapted to this purpose, peaches, pears, plums, pineapples, cherries, and currants are the most generally used, and are prepared as follows:—Stone the peaches, plums, etc., by making a small incision in the side, through which the seed is slipped, pare and quarter the pears, and cut the pineapple into slices half an inch in thickness across the fruit. Weigh and allow an equal quantity of the best white sugar, make a rich syrup, adding one small cup of water to each pound

of sugar. Boil for a few minutes together, then add the fruit and cook gently until clear, but unbroken. Remove carefully on to a wire strainer and let it stand about an hour, or until perfectly cold, then sprinkle liberally with powdered sugar, and stand the strainer on a dish in a moderately warm oven for two hours. At the expiration of that time turn the fruit, sprinkling as before with the sugar, repeating the process until the juice has quite ceased to drip, and the outside is dry and crystallised. It is then removed from the oven and allowed to get perfectly cold, before being packed away in small boxes between layers of waxed papers. Thus packed and stored away in a dry place, it will retain its perfect condition for an indefinite length of time. It is perhaps necessary to add a word of caution in regard to overheating the oven, the exact amount required being ascertained by experimenting, since too great a degree of heat will most effectually change a delicious sweetmeat into the toughest of leather.—*Good Housekeeping*.

PRESERVING, CANNING, AND DRYING FRUITS.

Jellied Fruits.

A three-cornered flannel bag is best for straining jellies in moderate quantities. It must be strong, and is better for being long, so that the ends may be twisted to press out the juice. Never use metal vessels, but employ enamelled ware, or porcelain, or glass for jellies. For each strained pint of juice allow half to three-quarters of a pound of granulated sugar. Boil the juice slowly for fifteen minutes before stirring in the sugar. It is well to heat the sugar before adding it to the juice. Watch, stir, and skim the juice, and never cause it to boil rapidly. Jellies and jams should not be covered until cold. One quarter-inch depth of very finely-pulverised sugar laid on top of jam or jelly will effectually prevent mouldiness occurring afterwards. For currants allow a full pound of sugar to each pint of strained juice.

The fruit for jellies must be ripe, but not over-ripe, because then the juice is not so rich. It must be dry when gathered, and ought not to be overheated by the sun.

Freshly-gathered fruit is much the best for jellies or for jams. Do not let it lie in bulk for long before using.

Currants should be weighed with the stems attached. If any fruit requires to be rinsed, do it quickly and dry as soon as is possible.

Mash some of the fruit of berries, &c., in the pan, to provide a little juice to prevent burning; then add the rest, stir frequently, and keep gently boiling for fifteen to twenty minutes, or longer in very few cases.

The straining-bag is usually three-cornered and long, so that it may be twisted to secure pressure. When the fruit has softened enough by boiling place it in the bag and press out as much juice as can be made to flow. Strain it into an enamelled pan. Return the juice to the kettle, bring it to a boil, stir in the heated dry sugar, and stir until it is all dissolved. By this time the jelly should be ready to pour into the glasses or forms. If directions have been carried out the jelly will coagulate on the side of the ladle as it is taken out.

Apricots, apples, quinces, plums, and peaches should be first peeled, cored, pips or stones removed; then cut in pieces, cover with water, boil gently until well cooled, strain the juice through a jelly-bag, add $\frac{1}{2}$ lb. of granulated sugar to each pint of juice, boil until it ropes from the spoon—in about fifteen to twenty minutes.

Raspberry jelly should be made with one-third currants to two-thirds raspberries.

Strong pressure is needed to express the juice. A net-bag made of strong cord could be used outside the flannel bag, and the ends twisted by means of a stick. A proper jelly or tincture press is better than all.

A small quantity of dissolved wattle gum or of gum Arabic added to jelly or jam will give it great consistency.

Currant jelly may be made without any cooking by simply pressing out the juice, dissolve in it 1lb. of crystallised sugar for each pint of juice; place in jars, set out in the sun for two or three days; then cover with $\frac{1}{4}$ in. of finely-pulverised sugar, and close with paper or other covers.

Fig jelly is made by washing the figs; place in the kettle just enough water to cover the fruit, boil twenty minutes, strain out the juice; add $\frac{1}{2}$ lb. of sugar to each pint of juice; boil about fifteen minutes.

Grapes should be barely ripe. Clean and stem the fruit, cook for a short time till soft, strain off the juice, add 1lb. sugar for each pint of juice; boil again for ten minutes.

Crab apples should be fresh, sound, just ripe. Place 1gall. of fruit in the kettle, add 1pt. of water. Heat slowly till it boils, and continue until the fruit pulps; then pour off the juice, gently pressing the pulp back until no more juice can be obtained. Strain the juice twice through fine cloth; add 1lb. of fine crystal sugar for each pint of juice; boil and skim for fifteen minutes.

The remaining pulp of many kinds of fruits can be used for jam.

Canning Fruits.

Sugar is not necessary in canning any kinds of fruit, but is used as a syrup flavoring. A syrup made with 4lbs. of sugar to 1gall. of water is sufficient for most purposes.

Fruit should be just ripe, sound, not bruised, and quite freshly gathered.

Peaches and tomatoes are best when peeled. If first dipped into scalding water they peel easily. Peaches and apricots should be halved and the stones removed.

The "secret" of preserving by canning is this:—Decay is caused by minute organisms called "ferments," or "microbes," or "bacilli." These organisms cannot live in a temperature above 180° F. for longer than a few minutes. If the fruit, vegetable, or other substance is submitted to a boiling temperature for a time sufficient to effectually kill those germs, and is then (whilst at the killing temperature) sealed up so closely that fresh living germs cannot gain admittance, then decay and putrefaction cannot take place until some time after the sealed vessel has been opened and exposed to the air. The air is loaded with germs of all kinds, including those of moulds, mildews, ferments, and others; therefore canned goods must be used within a reasonable time after being opened or they will spoil.

The ferments, moulds, &c., must have a certain amount of moisture and warmth in order to live, so that if glue, for instance, were reduced to a very thin condition by addition of water it would ferment and become putrid. If fruits are boiled till they become of the consistency of cold glue of ordinary density as used by carpenters, that jam will keep good for years, even though no sugar may have been added.

To preserve fruit by canning, therefore, it should be boiled in thin syrup—(as before said, the sugar is added for flavor, and is not absolutely necessary to the preservation of the fruit)—for periods ranging from six minutes up to half an hour, as will be indicated in a table to be given directly.

When the fruit has been prepared for canning, place it in the cans, fill up with the syrup (which *may* be nearly boiling), place the cans in a boiler with hot water nearly to the level of the top of the cans, bring the water in the

boiler to a boil, and let remain (according to the variety of fruit) for the time mentioned in the table annexed, then fill up with boiling syrup from a vessel kept close by for the purpose, close the can (or jar) tightly, and seal down.

When glass jars are used a folded cloth, or some slats of wood, or some straw should be put on the bottom of the boiler and between the jars to prevent breakage.

A kerosene can with one side removed makes a good boiler for canning small lots, and two of these cans can be used on an ordinary stove.

When self-closing cans are used the top is usually sealed additionally by pouring melted beeswax or composition to fill up the circular rim.

Glass jars are provided with rubber rings and a means of pressure—either a clamp-wire or a screw-cap.

When cold the cans or jars should be stood upside down for twenty-four hours, and if any leak is found the work must be done over again with the contents of that particular package. Another method of testing consists of taking the jars or cans, when they have cooled down, and standing them upside down in the water in the preserving boiler. The water is then heated and bubbles will soon issue from any leaky jars or cans.

Where glass is used the vessels should be stood in a boiler of cold water nearly up to the neck; bring the water to a boil by the time the fruit and syrup are ready to fill in, and after sealing leave the jars in the water till cold. It will be advisable to put straw or a folded cloth at the bottom of the boiler, else the glass may crack.

Table for Boiling Fruit for Canning.

The following table gives the time for boiling the various fruits and the quantity of sugar per quart of water most generally used in the syrup:—

	Time to Boil the Fruit. Minutes.	Sugar to Quart of Syrup. Ounces.
Apricots, halved	5	16
Apples, acid, quartered	10	6
" Crab or Siberian, whole	25	8
Blackberries	6	6
Cherries	5	6
Currants, ripe	6	8
Grapes	10	8
Peaches, halved	8	4
" whole	15	4
Pears, halved *	20	6
Pineapple, sliced	15	6
Plums	10	8
Raspberries	6	4
Rhubarb	10	10
Strawberries	15	8
Tomatoes, peeled †	20	None

* Only best dessert kinds.

† Use a little salt, say 3oz., to the quart.

There are difficulties in canning peas, beans, and several other vegetables. They are better cured by drying in an evaporator. If canned use a good lot of salt and cook much longer.

Drying Fruit.

The greatest point in fruit-drying is to avoid drying it too much. It is perfect when no water will press out when squeezed, and it should be quite soft. Fruit that is dried beyond that degree is more or less spoiled.

Fruit cannot ferment unless there is enough moisture in it to squeeze out when it is pressed.

Plums must be perfectly ripe before being dried. As they do not all ripen together on the tree, those that are fully ripe from time to time should be picked. Plums are usually dipped in a boiling lye for four seconds to cause minute cracks in the skin, and thus hasten the drying by several days. The lye

is made with 16ozs. Greenbank's concentrated lye in 12galls. of water. The plums are placed in a wire basket, dipped four seconds, then dipped into a tank of clean warm water to rinse off the lye; next spread upon wire-net trays and dried in the evaporator, or upon ordinary wooden trays and dried in the sun. After they are dry it is advisable to dip them three seconds in pure boiling water, on the surface of which a little glycerine or olive oil is placed. This treatment kills any insects or their eggs, and gives the plums a gloss. They should then be spread on trays and placed in a moth-proof room to dry.

Apples are best peeled, cored, sliced in rings (there is a small cheap hand-machine that does all this at one operation), dropped into cold water in which 1oz. of salt per gallon has been dissolved. (This keeps them white until they can be sulphured, when the white color is permanent.) Next, the rings or slices are placed on trays made of hessian or scrim, put into the sulphur box or room, left for ten minutes, and then evaporated on wire net trays in the machine or dried in the sun.

Evaporating by machine is by far the best, because the fruit is dried in a few hours, it is free from dust, the drying can be regulated all the time, and the fruit can be removed at once to an insect-proof room to cool, to be sweated, and to be packed, free from the attacks of moths, beetles, &c., which get at the sun-dried fruit.

It is very important to have the fruit all of one size, and of equal ripeness, on each of the trays, because otherwise some will be dried too much and the rest not sufficiently dried.

Sweating is done to make the whole lot evenly moist and soft; some would otherwise be a little too dry, and some not dry enough; so the dried fruit is put into a heap and covered with bags. The process may occupy only a few hours, or it may take a few days. Examination will show when the fruit is fit to box up.

Peaches and pears are usually peeled, and the pits are removed from the peaches, which are also halved, whilst the pears are quartered. Both are generally sulphured, to bleach the fruit, but the flavor is certainly not improved in any fruit by sulphuring.

Apricots should be very nearly but not quite ripe for drying purposes. They are split, stoned, and bleached by sulphur, which is not necessary, but makes the product bright and attractive at the expense of flavor.

Nectarines are treated in the same way as peaches, and quinces are treated like apples.

Figs should be dead-ripe, then placed on trays exposed to sun heat, turned, and packed tight in boxes when no moisture can be squeezed out.

Grapes are dried on wooden trays, exposed to sun, and turned over every day. When no moisture can be pressed out the raisins are fit to box up.

"BASE" VINEGAR VERSUS REAL VINEGAR.

The advocates for spurious vinegar say that acetic acid is the base of all vinegars, therefore pure acetic acid diluted with water must be the most wholesome, because, they say, all other vinegars contain a number of what they—the "base" vinegar-makers—call "impurities." They also claim that acetic acid solution cannot become putrid, whereas the vinegars made from wine, fruit, honey, malt, &c., are practically undergoing the putrefactive process. But every kind of wholesome food must necessarily be subject to the action of the germs which cause decay and dissolution, and anything that is not subject to such action either retards or absolutely arrests digestion and assimilation, therefore must be injurious when used as food. It is no more correct to assert that the true vinegars—from wine, malt, honey, fruit, &c.—are in an incipient

state of putrefaction than it is to say that bread, meat, and all other equally wholesome food substances are in a state of decay. If such substances were not liable within a short or a slightly longer time to decay, they would not be wholesome. If the makers of "base" vinegar really believe that their mixture of acetic acid and water is far more wholesome than the sour wine, &c., why do they add dyes or colorings and flavorings to disguise the nature of their compound? Perhaps they will not admit that such additions are adulterations of their "pure basic vinegar." The truth is, that acetic acid is so cheap and so sour that it acidulates a great quantity of water, and no natural vinegar can compete with it. But "base" vinegar is neither nice nor wholesome, whilst the natural vinegars made from pure wine, cider, malt, honey, &c., are both nice and wholesome if used in moderation.

ORCHARD NOTES FOR DECEMBER.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

The spring season for this year has been unusual. The oft-recurring showers have been favorable to the growth of vegetation generally, and while fruit trees are not excepted, in some districts the rain has not proved an unmixed benefit to them. The various fungus diseases are rampant. We might expect such to be the case, seeing they also are of vegetable growth and revel in the climatic conditions so suited to the well-being of their host plants, viz., our cultivated fruits. In passing through apple orchards at the present time the varieties more susceptible to the *Fusicladium* disease can be readily distinguished.

Although in some instances the trees sprayed with Bordeaux mixture are badly attacked, in most cases their comparative freedom from the disease is marked. The presence of this fungus has reduced the setting of the apples and pears to a marked degree, and on the whole the crop promises to be below ordinary quantities. The promise for the general crop of fruits is meagre. Where disease has not interfered there are indications of high quality in some lines. Taken on the whole our fruit-growers are gradually improving their methods of handling fruit. Half a dozen years back the best conducted shops dished out their strawberries in a semi-liquid mass. To-day even the barrow-men in the gutter serve them in chip berry boxes. Doubtless the time is coming when all soft fruits will be packed and retailed in separate receptacles, thus retaining their naturally attractive appearance.

Up to the present stage very little need has arisen for irrigating trees within the districts of average good rainfall. As the end of the year approaches, however, on the plains we must expect to be called upon to apply water to our trees. Apricots may be "topped up" to considerable advantage when the fruits arrive nearly at a full-grown condition. Peaches also are greatly benefited, especially if a little stimulating manure be spread immediately before giving the water. A wheelbarrowful of stable manure in a fairly fresh condition placed in a "saucer ring" around the tree, so that the water soaks through it, yields good results. The after treatment of the soil is of the very greatest importance. Irrigated lands tend to lose their fine texture rapidly if carelessly treated. Unless the bottoms of the rings or furrows in which the water flowed are broken up after each irrigation, "hard-pan" inevitably forms in the majority of our soils. We should never forget the object desired is to get the water into the ground and not over its surface. To enable irrigation to be carried on successfully for many years, deep preparation of the soil prior to planting is of the utmost importance.

In those orchards where the rain showers are the only source of water supply,

budding may need to be performed during this month. This is owing to the flow of sap slackening. If buds are put into deciduous trees now, they should not be forced into growth. For this reason the top portion of the stock plant above the inserted bud should not be shortened or interfered with.

The undesirable shoots upon newly-planted trees may require attention in the direction of nipping out their growing points from time to time. The leading shoots should not be touched unless some strong growers are leaving the others too far behind. In such instances these strong ones should have their growing points—only the top bud—nipped out.

Grafted trees will require attention. The waxed bands may need cutting to allow proper expansion of the growth. On old stocks the water shoots below the scions may need their growing points pinching out to restrict their progress.

The red scale of citrus trees will now be breeding actively, and the time has arrived to begin spraying the trees. The most effective spray here is the resin wash. Unless our citrus growers attend to this pest it is bound to become as injurious as in former years. In New South Wales and Queensland the use of the fumigation tent is becoming more general, and as the tendency of every country is now to refuse scale-infested fruits, we must be up and doing or lose our markets.

The codlin moth trouble has begun for the season. There can be little doubt the training of our trees is a great bar to the effective checking of the ravages of this pest. We must have smaller trees before we can hope to subdue this insect. A large fruiting surface must be obtained to secure an abundant crop; but we should, in the presence of this difficulty, seek it upon an increased number of small trees rather than upon a few large ones. Now is the vital time when efforts should be made to subdue the first brood of insects. It is to be hoped those growers who are largely interested in other fruits will not allow the pest to become too firmly established for the season by neglecting at this juncture. It is to be hoped those growers who have begun to spray with arsenites for the pest will not be satisfied with a couple of dressings. I know spraying is a time-consuming work, and to treat a large orchard is expensive. Let those, however, who have begun fully satisfy themselves by spraying at fortnightly intervals throughout the season a limited number of trees. The results will be highly interesting, and, I believe, profitable to the growers undertaking the work. The attention to bandages should be close and thorough. A friend has suggested that as the caterpillars usually secrete themselves in the bark immediately beneath the bandage, a stiff hand brush could be used with advantage over that space when examining the bands. The habit of attaching themselves to the tree stems just beneath the surface of the soil should be circumvented by stirring and scraping that portion from time to time.

WHEN TO CUT LUCERN.

The following information has been specially published by the Manhattan (Kansas) Experimental Station for the information of lucern (alfalfa) growers:—

Alfalfa should be cut when not more than one-tenth of the plants have come in bloom. Cut at this early stage, the yield of hay for the season will be much greater than if the alfalfa is cut near maturity, and every pound of hay secured will be worth more for feed.

At the Kansas Experimental Station a strip through a field of alfalfa was cut when one-tenth was in bloom, another strip was cut after full bloom had passed. The strip cut early was nearly ready to cut the second time when that cut after full bloom was being harvested the first time. The strip cut early grew vigorously through the season, and made three cuttings and a good aftermath. The strip cut after full bloom gave a low yield the first cutting, and did not grow sufficiently to yield a good second cutting. Early cuttings seem to invigorate the plant.

The late cutting of the first crop seems to injure the plant more than at any other time, and we have found it profitable to cut alfalfa the first time as soon as one-tenth was in bloom, even though the weather was bad and we knew that the crop would spoil in curing. The increased yield from succeeding cuttings over that cut late much more than makes up for the loss of the first crop.

Successful clover-growers, the first time they try alfalfa, often ruin the stand, so that it has to be ploughed up, by waiting to cut until it reaches the stage at which clover is usually cut.

The great value of alfalfa is the large amount of protein it contains, that material in feed that is absolutely necessary for the formation of blood, lean meat, and milk. The higher the protein in alfalfa the more valuable the crop. The Chemical Department of this Station found the effect of cutting alfalfa at different stages as follows:—

	Protein.
One-tenth in bloom	18.5 per cent.
One-half in bloom	17.2 “
In full bloom	14.4 “

The Colorado Experimental Station found the effect of cutting the alfalfa as follows:—

	Protein.
Coming in bloom	18.5 per cent.
Half in bloom	14.6 “
In full bloom	12.9 “

The Utah Experimental Station for five years cut alfalfa at different stages of maturity and fed the crop in producing beef. The average production per year per acre was as follows:—

	Hay.	Beef.
In first bloom	5.35 tons	706lbs.
In full bloom	4.90 “	562 “
Half-blooms fallen	4.55 “	490 “

These experiments made in three States—Kansas, Colorado, and Utah—prove that alfalfa cut in the first bloom will give the greatest yield and feeding value. The leaves of alfalfa contain more than three times as much protein as the stems, a ton of alfalfa leaves containing as much protein as 2,800lbs. of bran. Every care should be taken in curing alfalfa to save the leaves.

NOTES ON VEGETABLE-GROWING FOR DECEMBER.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

In a general way only those kinds of vegetables that flourish during summer heat are grown upon the plains at this period. Such root crops as red beet and short-rooted varieties of carrot and parsnip can, however, be produced where good free soil and abundance of moisture is available. In a commercial way those grown in the Hills would be cheaper, but to the small gardener, who wishes to provide for himself only, there is much in having these vegetables fresh, crisp, and handy.

Plants of the pumpkin and marrow sections of the cucurbitaceous family will begin to send out runners freely now, and will need abundance of water. If pressure is available, water applied by means of overhead sprinklers is much appreciated by these plants. It is not well to sprinkle them during the hottest part of the day. These plants, under such treatment, send out roots from beneath the joints of the creeping stems, and thus assist the main roots to support the foliage. It is a good plan to place a heavy clod upon each of the runners to prevent the wind moving them about.

Cucumbers also like to be watered overhead, but as a rule the other melons, such as water, pie, and sweet kinds, do not appreciate such methods as well as when undersoaked. When the members of the melon family begin to “run” they respond to a small dressing of superphosphate sprinkled around each plant and watered into the soil.

Dwarf and runner beans need abundance of moisture now. Unless the soil is inclined to sour it is almost impossible to give them too much. Those

bearing pods need close picking, so that no pod shall ripen seeds. If seeds are permitted to mature the plants will cease to bloom, and the yield be lessened very much. A light sprinkling of superphosphate hoed in between the rows just before applying water will benefit fruiting bean plants. Successional sowings of these should be made every three or four weeks. The seeds should be soaked by having fairly hot water poured over them. When sown the soil should be moist, and the seeds covered with broken manure or something loose enough to permit the brittle germinating shoot emerging through to the light.

Tomatoes should be staked off the soil if early ripening fruits are sought. These plants should not receive very much stimulating manure or water until a good many fruits are definitely formed upon them.

Onions and potatoes should be harvested as soon as ready, otherwise the heat of the sun will damage the former or the potato moth the other.

Beds of asparagus should be stimulated where practicable. If manure and water are used freely now the plants will be strengthened, and an increased number of heads made available next year. Rhubarb on the plains requires to be mulched and watered. With fair attention it succeeds admirably.

In the summer, when sa'ads are very desirable, the plains gardener finds it a difficult matter to produce plants. Cresses, radishes, and lettuces do fairly well under any shade, beneath stages in lathhouses, &c., if kept moist and cool and the soil is enriched.

The planting of capsicums and tomatoes will be carried on still, though the season is advanced upon the plains.

All undesirable vegetables now passing to the seeding stage should be destroyed to avoid contamination of better kinds.

The soil between all growing crops should, as far as practicable, be kept in a finely pulverised condition.

FOREST PLANTING AND TIMBER SUPPLY.

BY F. E. H. W. KRICHAUFF.

No. 2.—What is Done in the United States.

I think it will be my first duty, after having shown in my previous article that we cannot here for the future even rely on obtaining firewood at a reasonable price with the present rate of consumption and insufficient planting of forest trees, now to inquire whether we can rely upon obtaining sufficient and cheap timber from elsewhere. I will therefore first relate how matters shape in the United States of America, which has exported hitherto—and also to this State—such large quantities of fine timber. By analogy we can then also pretty safely calculate how most other timber-exporting countries reduce the area of their forests, for true forestry is only carried on in a few of those countries that have scarcely enough for their own use.

The neglect which the Government of the United States has shown almost up to date, as regards forestry, is all the more surprising when we hear of the large expenditure in support of other branches of agronomy. Our North American friends are informed by Mr. N. A. Eggleston's comparative calculations that the commercial value of forest trees is so great that their products exceed those from any other source. According to the statistical reports of the Department of Agriculture of the United States for the year 1894, the value of the cereal crops was £208,601,589, while that of the products of the forest for that year was £3,000,000 in excess. Or another comparison was that the

whole value of all mineral products of the United States raised was only about one-half of the forest products; but comparatively little attention has been given even to these startling comparisons.

According to the latest information on "The Progress of Forestry in the United States," by Forester G. Pinchot, and "The Practice of Forestry by Private Owners," by Professor H. S. Graves, little noteworthy progress has been made beyond the incipient stage of forest protection by the Government. Nor are any of the States more advanced—not even New York State with its 1,250,000 acres of forest in the Adirondack and Catskill mountains, although the Legislature of that State lately appropriated £450,000 for a further increase in that area by purchase. But no practical forestry is as yet attempted; it is only forbidden to cut *any* trees—and that is not forestry. The New York Forest Commission have now made an application to the Division of Forestry for working plans.

There have been many laws to prevent forest destruction since 1799, mainly in the interest of the U.S. navy; but only after the Civil War, in 1867, was tree-planting by private owners encouraged, and Congress passed several Acts from 1873 to 1878, which provided for the granting of homesteads to settlers who planted one-fourth of their land with certain specified kinds of trees. Another Act provided that every future sale of land should contain the condition that at least 10 per cent. of the timbered land shall be kept perpetually as woodland, or, if not timbered, 10 per cent. of it shall be planted within ten years with timber trees, when an abatement of 50 per cent. is to be made on account of the expense of planting. It appears, however, that the results were not encouraging, and I believe these Acts were repealed in 1891. Thenceforth the amount appropriated for the protection of the general public timber lands, which up to 1878 had been only £1,250, was increased first to £6,250, and in 1893 to £30,000. In February, 1896, there were 18,000,000 acres of forest reserves; but in 1897 a committee of seven of the National Academy of Sciences, after travelling at a cost of £6,250 over the Union, recommended eleven new reserves to be made, containing more than 21,000,000 acres; and the late President McKinley reserved up to January 1st, 1900, further 6,708,425 acres; so that about 47,000,000 acres are now withdrawn from sale and held as federal forest reserves. Congress also increased the appropriation to £46,750. Most of it is used to protect the reserves from fire, the foremost enemy of forests in America, for which a force of nine superintendents, thirty-nine supervisors, and about 350 forest rangers are appointed. Legally there is no obstacle to the introduction of the most practical and approved forestry, but for this the appropriation is entirely insufficient. Public sentiment is, however, more and more aroused. There are twenty-two associations in the United States which are doing good work towards the spread of right ideas about forestry, also through some monthly or bi-monthly journals. Thirty-two State agricultural colleges give elementary instruction in forestry, and the University of Minnesota and the Cornell University deserve special mention. Quite lately, in many of the States, forest commissions or forest boards have been created. Pennsylvania and Michigan especially move now towards a more satisfactory treatment of State forest lands, and have acquired very large tracts of the wild lands of their State for forest uses. But after all the protection of the forests swallows nearly all sums provided. Fortunately we have had as yet only one or two insignificant fires in our reserves; but the fearful destruction by fires in Minnesota and elsewhere made it necessary for many of the States to pass Forest Fire Acts, to appoint fire wardens with power to summon persons to assist in checking or putting out fires, paying fitting compensation for time actually employed. This is payable one-half by the State and one-half by any town situate in a forest reserve. It is a

misdeemeanor to fire woods or waste lands, whether wilfully or negligently, and the offender may be punished by imprisonment up to a year or a fine up to £12 10s., irrespective of any payment as damages. Lumbermen have therefore also a fire patrol that watches campers, and follows during the dry season every train to extinguish any fire that may be lighted by locomotives; and all woodmen have orders, no matter what they are doing, whenever they see smoke arise to go to it. Dr. W. S. Webb, who owns 40,000 acres, has these divided into four sections, each watched by a woodsman living in the centre of his section. The houses of the rangers are all connected by telephones, so that all available men can be quickly called out. Dr. Webb himself can also send a locomotive with his "fire service," which consists of a large tank on a flat car, to which is attached a box freight-car, containing an engine for pumping the water from the tank, and a hose and tools.

Very simple, but very expensive, seems to me another plan, followed frequently in the turpentine forests—to cut them by roads into 200-acre blocks, which are raked by garden rakes and all rubbish is burnt before the dry season. Others burn over the forest in winter or early spring, when the ground is damp and the fire can be kept under control; but this plan destroys most of the young seedlings, and either of these plans is ultimately an injury to the permanence of the forest, and diminishes the advantages we expect from the fallen leaves, and it also destroys the sponginess of the soil.

It must, however, be acknowledged that the Division of Forestry (now called a bureau) has made special studies of the growth and production of a number of trees by means of plantations, from which practically all the results after many years may be gathered. Close relations have also been established with five of the most competent men in the treeless regions, with a view of reporting on tree-planting in these places, as it has been proved by the planting of trees for more than thirty years over many portions of the West, by arbor days and otherwise, that crops are dependent upon the protection of trees. An article by Mr. William L. Hall, of the Division of Forestry, on "Forest Extension in the Middle West," published in 1901, states that Western plantations are aimless, and lack system in both planting and management, and only a small percentage is thrifty. Trees of no practical value are planted, or, where winds are terrific and almost constant, plantations have been made towards the quarter from which no winds blow; trees that thrive best close together are planted far apart; those that thrive on porous soil are unhappily planted in clay. Yet some plantations show a profit and promise rich return, equal or exceeding returns by agricultural crops, but most fall short of this maximum return from lack of congenial soil or of proper management. Slipshod methods have failed, and the diminution of timber in the Mississippi Valley has been so general that little is left in Western Iowa and Missouri; and where there is timber in the Middle West there are sawmills of immense capacity, working night and day. Mr. Hall says that 90,000,000 railway cross-ties are annually required for renewal, at 25 per cent. advance on the price ten years ago; also 600,000 telegraph poles, at 50 per cent. advance; and these quotations take no notice of requirements for street car traffic and of suburban lines. He states that Catalpa plantations, made twenty years ago, show now some trees large enough for ties, while White Oak requires thirty to forty years. In 1901 more trees will have been planted than ever before, but if 500,000 acres were planted annually in the Middle West their produce would yet be inadequate to meet the requirements of that country. The visit of an expert forester has had a salutary influence upon the people there, by educating them to a higher appreciation of the value of forests and on systematic planting. There is no question but that the extensive planting on the prairies, carried on with judgment and skill, is profitable to the owner and helpful to the country. The annual report

of the Secretary of Agriculture for 1900 also states that public interest in forest matters is just now not only keener and wider than ever before, but it is growing with a rapidity without precedent.

It is, however, even now a fact that the forest area is being depleted at an unreasonable rate beyond actual requirements of the settlers, as there is no check upon enormous waste and indiscriminate destruction, irrespective of the demands from abroad. The annual growth of 1,200,000,000 acres of woodland is now used, whereas the total forest area is less than 500,000,000 acres, so that more than half of the annual consumption is already a draft upon forest capital. If this is well considered, even the selfish indifference for the wants of the future displayed by the lumbermen might be somewhat checked, and they will take not only better care to prevent fires, but also to protect the seedlings and young trees, of which they hitherto took not the slightest notice.

POULTRY NOTES.

BY D. F. LAURIE.

NOTE.—Letters of inquiry, &c., should be addressed to me, c/o Engineer-in-Chief's Office, Adelaide, enclosing stamped envelope if reply required.

In the report of the paper read by me at the Congress, *vide* November number, page 353, I am reported as saying that "sometimes Plymouth Rocks throw black stock. That is how we get the Orpington." The first sentence is quite correct, but, as regards the second, what I said was, "The Black Orpington is a cross between the Langshan and Minorca, with an infusion of Plymouth Rock blood through the medium of black specimens such as mentioned." Strictly speaking, the Black Orpington owes more to the Minorca and Langshan than to the Rock. Again, in answer to Mr. Cockburn, on page 355, I am reported as recommending "in the case of pneumonia bathe the fowl's eye with warm water with a little eucalyptus in it." This would be a remedy for canker on the eye, not for pneumonia, which is inflammation of the lungs, &c.

Poultry Diseases, No. 3.

NOTE.—I regret to hear that disease is rife among the poultry in various parts. Anyone so troubled, and wishing my advice, should write at once, giving full information. First of all, isolate all affected birds, and describe as follows:—

1. General appearance, and whether food is partaken of.
2. Whether free from vermin of all sorts.
3. Nature of droppings.
4. Appearance of comb and face.
5. Examine under tongue and near opening of windpipe for ulcers, sores, cheesy-looking deposits,

Perfect cleanliness, fresh water carefully shaded, and a free application of slack lime about the runs and houses tends to ward off diseases.

CHOLERA.—Fowl cholera is an epidemic diarrhœa, chiefly due to great heat, and I am convinced in many cases to the activity of old germs, caused by suitable climatic conditions. Cholera may originate in a yard, and no other cases occur in the district; still there is always danger from the spread of the microbes by the aid of wind-borne dust, &c. Cases have been reported, and I have personally known where a serious epidemic has occurred as follows:—A bird dies from some cause, very often common diarrhœa or dysentery. The body is allowed to lie about, and the other birds peck at it and consume the poisonous flesh; in consequence some bird will sicken and die,

and spread the disease, as in the first case, or through its droppings, and so the disease spreads with increasing malignity. Filth and dirt generally play an important part in the development of cholera. Very often the fattest and healthiest of the flock alone are attacked; sometimes the young ones alone—very often every bird is affected and dies. Putrid meat is a frequent cause, and in several cases I have known of the trouble originated from the foolish practice of throwing putrid meat to the birds and dogs instead of burying it deeply or burning it. Unless surroundings or climatic influences are decidedly unfavorable it is a general rule that cholera increases in virulence as it progresses and attacks fresh subjects. Sudden cold after a spell of heat often arrests its course, although the birds already attacked may die. The dirty and slothful habit of throwing the food on contaminated ground is a very fertile cause, and is one that cannot be too severely condemned.

Fowl cholera attacks suddenly and runs its course very quickly. The early symptoms generally are the dull, listless appearance of the bird, the rocking motion of its body and the peculiar gait with the dragging of the legs giving a cramped appearance. The feathers are ruffled and the wings drop, the eyes appear sunken and the lids swollen, and often in an irritated condition. The birds often refuse to eat, but suffer great thirst, and huddle together or lie in the sun for warmth. Diarrhœa is present from the first, being at the outset glairy and mucuous, later on white and frothy. As the disease progresses the depression is more marked, and the head is carried low, or frequently stretched along the ground, and the wings spread out. The gait is staggering; the droppings are white, watery, and often tinged with blood, and, as a rule, very offensive. The feathers at the vent are wet and matted together, and the mouth is full of dirty-looking, sticky, or frothy matter, which often exudes from the nostrils. The comb becomes flaccid and deepened in color towards the border, where it is often black. As these symptoms increase the bird is disinclined to move, and often stands with the wings held up, or it squats or lies on the ground. The breathing is short and very labored, and general appearance denotes the severity of the attack, and the bird dies in a stupor, often struggling wildly at the last and uttering peculiar cries. Some die quietly; others again appear as if seized with vertigo—the diarrhœa is always frothy, foamy, or sparkling. The duration of the attack may vary from a few hours to two or three days. The general *post mortem* appearances are as follows:—The body externally is usually of a bluish or slightly purple tint, with the exception of the crop and abdomen, where the color is dark green. Other characteristic signs in a majority of cases are:—Membrane, or lining of the mouth, livid, except outer portions, which are very often pale; the throat is generally purple and full of yellowish offensive matter, and as a rule the end of the tongue is hard and thickened; as previously remarked, the eyes have a sunken appearance and the eyelids themselves swollen. The gizzard is as a rule empty, but occasionally contains a little gravel and thin fluid which is acrid; the muscles are often of a deep-red color, and the intestines very much inflamed, with patches of extravasated blood under the mucuous membrane, and very often a keen observer will notice corrosions or actual demolition of the structures. The contents of the intestines are of an acrid, dirty nature; the liver is deeply congested and very often increased in size; the lungs show the characteristic signs of congestion and pleurisy. The heart, often seriously affected, is of a peculiar red color studded with spots (extravasated), while the pericardium (the space round the breast) or heart sac, is often full of a straw-colored fluid. As to treatment, it is here that not only the poultry specialist, but the physician and scientist are at fault. Without entering into a scientific discussion, it may be stated that evidence points to similar characteristics in epidemic poultry cholera to those accompanying Asiatic cholera in the human

subject. Early treatment is of vital importance. I have recently been interviewed by sundry who are sufferers through this fell disease, and my plain statement of facts has had a disheartening effect. You must guard against and prevent the spread of cholera; all curative measures are distinctly experimental.

Still the sufferer may essay a cure, and the following suggestions are the result of my personal experience, and some have proved effective in the hands of others. I have described the most salient and usual features which particularise an attack and, as they are somewhat unusual, may be accepted as definite symptoms. It may be taken as a golden rule, not only with regard to this fell disease but to all, viz., isolate all affected birds and give scrupulous attention to cleanliness and disinfection.

In this respect, I am often met with the objection that, birds having an extensive run should be free from the effects of possible contamination. Naturally the more extensive the run the harder work is necessary to ensure cleanliness of the total area. This would be less if people took a little trouble. House scraps are generally thrown to the poultry, but it is simply making trouble to throw such scraps to the poultry as they cannot and will not consume, and it is here that the general trouble results. Take a little trouble and keep a special receptacle for the poultry scraps, and see that no others are collected in it. Keep it fresh and clean, and do not allow more than a few hours to elapse before it is emptied. When emptied, scald well so as to avoid fermentation and other chemical changes. If this is too much trouble do not complain. Then again, as stated, food must not be thrown on dirty, excreta-saturated ground. An affected bird will spread the disease through its droppings, for in them will be found the microbe in its most dangerous form.

The curative measures embrace common salt (sodium chloride), which has proved effectual, and doubtless Epsom salts given sparingly, as so often directed, would have an excellent effect. In the advanced stages all efforts are more or less experimental, and, considering the nature of the disease, may be termed heroic. Chlorate of potassium has been used, but what is more common is some form of opium, such as chlorodyne, four to six drops in a teaspoonful of water, $\frac{1}{2}$ -grain pills of opium, or four to six drops of painkiller in water occasionally are useful; carbolic acid, No. 1 or No. 2, one drop in ten drops of glycerine twice a day. In any case I advise the free use of a powerful disinfectant in a liquid state applied with a watering can to the soil of houses and runs. M. Pasteur, the eminent French scientist, some years ago gave particular attention to the subject, and sent assistants to England to conduct a series of experiments in inoculation with attenuated virus. Experiments have also been conducted in America, but the verbiage of the experimenters is so profuse and flatulent that no exact data can be derived. With all the experiments and remedies prescribed, it seems that the onus still lies with the poultry-keeper, and that in a large measure this and similar epidemics are entirely due to carelessness and lack of hygiene.

I should like to say now that while dealing with the serious results of disease I do not wish to be considered pessimistic. I should not be doing my duty if I failed to point out the dire effects of neglect in such matters. I have much pleasure in announcing that a leading scientific authority has kindly consented to aid me in arriving at certain definite conclusions *re* certain diseases, and later on I hope to publish something of wide interest. It is a curious fact that the true value of bird and animal diseases have occupied but little attention at the hands of the trained scientific inquirer. We have had empirical surveys, but they are of little import. I have no veterinary training, and have only research and practical observation to guide me. My experience tells me that, so far, all are in the same predicament. Few diseases of poultry are of any great moment unless of an epidemic character, and we find that

these are entirely due to neglect of ordinary sanitary precautions. It will be abundantly demonstrated that no reference is made herein to organic or structural defects, which are, in general, due to other and preventable causes. As a matter of fact, the troubles of various poultry-keepers are occupying much of my time, but the toughest morsel to digest is the astounding ignorance as to what constitutes cleanliness.

(To be continued.)

Mr. J. Maude.

I have a letter from this well-known expert, now in England. He is purchasing a lot of valuable birds for various Australian breeders, and has a commission to buy Indian Game and Dorkings for the Boys' Reformatory at Magill. He is also purchasing a high-class lot of stock birds for me—the end in view is to spread them among *Journal* readers.

FARM HINTS FOR DECEMBER.

BY THE EDITOR.

Some people profit from experience; but there is plenty of proof that there are others who will suffer adversity time after time without profiting from its lessons. Live stock of all descriptions have died from starvation on land that last year or the year before had a great surplus of herbage or of straw upon it. No effort was made to lay up a provision against future contingencies, the natural grasses and herbage were allowed to waste upon the land, and the straw remained unstacked. This has been the record at very frequent intervals during the sixty odd years of the history of South Australia, and similar records exist with regard to other countries so long back as the time of Pharaoh and his steward Joseph. Farmers do get in some hay for their horses—often not nearly enough; but how few are they who stack large quantities of straw; and yet it has been shown time after time that straw is of considerable value as food for live stock, and that it possesses more value the earlier it is cut. When the farmer has abundance of straw he is justified in keeping many animals on his farm, because he can be sure of food for them if a dry season should occur—and dry seasons are of far too frequent occurrence now. When nearly all farmers use the string binder to harvest their wheat crops the steam-thrashing gangs will come into existence, huge stacks of straw will be seen over the whole of the land, and cattle, sheep, and horses will be abundant on every farm, and the farmers will be prosperous and happy.

Water conservation is another great want in many districts in the North. If the farmer can make adequate provision for himself it is of great advantage; but it is a costly work to excavate a reservoir of sufficient capacity to supply water for all requirements during a dry season. The larger the reservoir the smaller the cost in proportion to its capacity. If a number of farmers would combine their capital they could construct a large reservoir at lower cost and greater capacity than would be the cost and capacity of a number of small reservoirs. They could also, in many cases, have pipes to deliver the water on to their farms. If they have not the capital to construct the large reservoir they can borrow at low rates of interest, and the interest and redemption charges would not amount to a tithe of the cost and inconvenience of carting water during the busy time from sources many miles distant from the farms.

The locusts have again damaged crops and gardens in the North, to a considerable extent in some cases. The chief damage done by locusts is whilst they

are unable to fly. If these locusts were killed whilst young their places would not be occupied by others coming from further north. The unwinged locusts can be easily and cheaply destroyed, and the work can be carried on from the day they emerge from the eggs until the host dies from age. The smaller the locusts the more easily and cheaply can they be destroyed. Until they begin to fly they mass themselves together, especially at night. All locusts can be attracted to poisoned baits, and the attraction extends to a distance of 60yds. Arsenic dissolved with soda, mixed with sweetened water, and then sprinkled on chaffed greenstuff, or sprayed on the herbage, or mixed with pollard, will kill the locusts, and the dead insects being eaten by their fellows will kill the cannibals also.

The cause of deterioration in domesticated animals and in cultivated plants is due to neglect of selection of the best types and specimens for propagation of the species. There is a constant tendency to reversion to the origin from which the improved strains have been developed by intelligent care in selection and breeding. It is possible to develop new and improved varieties by cross-breeding, but the new varieties must afterwards be maintained in their purity by constant selection and propagation of the best types. The careful farmer will, therefore, maintain nursery plots for seed purposes. He will go through his crops, when just ripe, and select the best typical seed heads and carefully multiply them in his nursery plots, and from those plots again he may select even better than the average, and multiply those separately until he gets enough to sow a large area.

The field poppy has come to stay with us, and it can be easily converted into a dangerous pest by ploughing the dropped seeds deeply into the soil. Like the wild oat, charlock, and many other weeds, the seeds of poppy will retain their germinative power for many years if they are buried 4in. or 5in. below the surface, and will start to grow whenever the plough or other implement turns them up towards the surface. As soon as possible after the grain crops or hay have been taken off the field it is desirable and advantageous that the surface should be scarified or harrowed a couple of inches in depth. This will bury most of the seeds of all kinds, and also enable all rains to soak into the soil. The first good rains will start all the weeds into growth; and, besides giving the chance of early green stuff for the live stock, the weeds can be ploughed under, thus enriching and cleaning the soil. It would be profitable before scarifying to scatter 3lbs. of a mixture of White mustard and Essex Broadleaf rape seed per acre on a portion of the land.

All sorts of sorghums, maize, kail, and other summer fodder crops must be frequently shallow hoed during growth, else the surface becomes caked and moisture quickly departs. The loose surface causes a lot of absorption of moisture from the air, and the admission of air into the soil is also very beneficial if the soil is not too lumpy. Hoeing is impossible when the plants are grown higgledy-piggledy, therefore they must be grown in rows. Stiff, hard clay soils, and those that are very dry and stony are not suitable for growing summer fodder crops as a rule, but buckwheat will grow on such land in some cases. It is very rapid in its growth, makes excellent fodder for cows, and in furnishing nectar for bees this plant has few that excel it.

Wise farmers will take every possible precaution to avoid losses from fire.

It is not too late to sow seeds of pumpkins and similar fruits. They do best when the temperature is constant between 50° F. and 90° F. Sandy loams suit these classes of plants, and they will do without much water in many instances. The vines or runners will not withstand blowing about by winds or shifting by hand. It is usual to prevent this by growing a few plants of maize, sorghum, or holcus amongst the pumpkins, &c., or a few short stakes are driven in. Soil rich in thoroughly decayed vegetable matter is favorable to

the production of large fruits. This applies equally to melons, cucumbers, &c. Pie melons ought to be grown extensively for cattle, pigs, &c., as well as for table purposes.

If horses are watered before being fed there will be less to fear from tympanitis or bloat after being fed. If they are watered after feeding, the water will carry a quantity of undigested food too quickly from the stomach into the intestines. The horse's stomach is comparatively small, and the animal should therefore be fed three times a day at regularly-divided intervals. When working hard he should have a more nourishing diet than when doing little labor.

November and December are the months when many of the indigenous annual grasses produce their seeds. Some effort should be made to leave a portion of each paddock ungrazed at this time. If this cannot be done, there is the greatest danger that those valuable grasses will altogether disappear.

It is quite proper to trust in Providence, but it is altogether wrong to tempt Providence by neglecting ordinary commonsense provision against fire, rain, storms, and other natural contingencies. Providence sends us rain, but we have no right to expect that the rain will not fall upon unthatched stacks. The sun shines upon the just and the unjust alike, and if the cows, horses, and sheep of the man who trusts to Providence are fenced in an open unsheltered paddock he should not complain if they are seriously injured by their compulsory exposure to a sun temperature of 160° F. On the contrary, if he had his deserts he should be chained up in a similar paddock and temperature for just one hour. He would then acquire experience, and shelter would be provided in abundance for his poor animals.

SOME USEFUL FARM MEDICINES.

The following formulæ by a member of the Royal College of Veterinary Surgeons in the *Cable* will be found useful in treating common ailments of live stock on the farm:—

A fever drink, useful in chills and colds in both horses and cattle, and for horses after a hard day's hunting, is extract of belladonna, 1 drachm; nitrate of potash, $\frac{1}{2}$ oz.; chlorate of potash, $\frac{1}{2}$ oz.; sweet spirit of nitre, 1 oz.; spirit of camphor, $\frac{1}{2}$ oz.; solution of acetate of ammonia, 2 ozs.; water, 8 ozs.

As a cleansing drink for cows, give carbonate of ammonia, $\frac{1}{2}$ oz.; powdered aniseed, 1 oz.; Epsom salts, 12 ozs.; give in a quart of ale or gruel.

Condition powder for horses when blotchy in their skins or changing their coats. Sublimed sulphur, 4 ozs.; nitrate of potash, 3 ozs.; powdered gentian, ginger, aniseed and fenugreek, of each, 2 ozs.; powdered capsicum, 1 oz. Dose, one tablespoonful occasionally in damped food.

Calves' cordial: Prepared chalk, 2 ozs.; tincture of catechu, 1 oz.; essence of peppermint, $\frac{1}{2}$ oz.; water, to 12 ozs. Dose, one to four tablespoonfuls, preceded by a full dose of castor oil. Lambs and young pigs suffering from scour may receive a teaspoonful to a tablespoonful, according to age.

A useful dressing for cuts and wounds is one part of pure carbolic acid to thirty parts of olive oil, while a slightly weaker mixture makes an excellent lubricant and antiseptic for use in all cases of assisted or difficult parturition.

A good dressing for sore shoulders and backs, greasy heels, bruises, when the skin is broken, and for use in cases of sprain is sulphate of zinc, $\frac{1}{2}$ oz.; sugar of lead, $\frac{1}{2}$ oz.; water, 1 qt.

Another lotion, excellent for hardening shoulders and backs, is powdered alum, 1 oz.; sulphuric acid, 1 drm.; water, 1 qt.

Acetate of lead: Astringent and sedative, useful in solution as a lotion.

Linseed oil: Safe laxative; horse, half to one pint; ox, one to two pints; sheep, quarter to half pint.

Sulphate of magnesia (Epsom salts): Laxative and purgative, acts principally on the back bowels; cattle, $\frac{1}{2}$ lb. to 1lb.; sheep, 4ozs. to 6ozs.

Tincture of opium (laudanum): Narcotic, sedative, anodyne, and anti-spasmodic, useful in colic in horses and cattle, and heaving or after-pain in ewes; horse, 1oz. to $1\frac{1}{2}$ ozs.; ox, 1oz. to 2ozs.; sheep, 2drms. to 3drms.

Nitrate of potash (saltpetre): Diuretic and febrifuge, a useful medicine, much abused by being given in too large doses frequently repeated; horse, 1drms. to 8drms; ox, $\frac{1}{2}$ oz. to 1oz.; sheep, 2drms. to 3drms.

Chloride of sodium (common salt): Tonic and vermifuge; horse, $\frac{1}{2}$ oz. to 2ozs.; ox, 2ozs.; sheep, 2drms. to 4drms. Best given in the form of rock salt to lick.

Sulphur (brimstone): Alterative and diaphoretic; horse, 1drms. to 4drms.

Sweet spirit of nitre: Stimulant, anti-spasmodic, diuretic, and diaphoretic; horse, 1oz. to $1\frac{1}{2}$ ozs.; cattle, $1\frac{1}{2}$ ozs. to 2ozs.; sheep, 3drms. to 6drms.

Oil of turpentine: Stimulant, anti-spasmodic, diuretic, and vermifuge; horse, 1oz. to 3ozs.; calves, 1drms. to 4drms.; lambs, $\frac{1}{2}$ drms. to 2drms.

Tincture of aconite (Fleming): Sedative and diaphoretic, useful in cases of exalted temperature; horse, 5 drops to 15 drops; ox, 10 drops to 20 drops.

Aromatic spirit of ammonia (sal volatile): Diffusible, stimulant, anti-spasmodic, and antacid; horse, 1oz. to 2ozs.; ox, $1\frac{1}{2}$ ozs. to 3ozs.; sheep, $\frac{1}{2}$ oz. to $\frac{3}{4}$ oz.

Carbonate of ammonia: Diffusible, stimulant, anti-spasmodic, and antacid, useful in cases of hoven in cattle; horse, 2drms. to 4drms.; ox, 4drms. to 6drms.; sheep, $\frac{1}{2}$ drms. to 1drms.

Aniseed: Stomachic and carminative; horse, 1drms. to 4drms.; ox, $\frac{1}{2}$ oz. to 1oz.

Extract of belladonna: Anodyne, useful in chill, cold, sore throat, &c.; horse, 1drms. to 2drms.; ox, $1\frac{1}{2}$ drms. to 3drms.

Camphor: Calmative and anti-spasmodic; dose of spirit for horses, $\frac{1}{2}$ oz. to 1oz.; sheep, 10 to 30 drops.

Chloral hydrate: Sedative and anti-spasmodic, useful in colic; horse, 2drms. to 1oz.

Cod liver oil: Nutrient tonic, useful in debility and for shy feeders; cattle, 2ozs. to 4ozs. in increasing doses.

Carbonate of iron: Mineral tonic and haematic; horse, $\frac{1}{2}$ drms. to 2drms.; ox, 1drms. to 2drms.; sheep, $\frac{1}{2}$ drms.

Sulphate of zinc (white vitriol): Astringent, useful in lotions.

Great care should always be taken to give medicines time to act before repeating the dose or giving other drugs of a similar class, and where domestic medication has proved unsuccessful, and professional aid has at length to be sought, a point should always be made of telling the veterinary surgeon exactly what has been given.

SYRUP OF LEMONS.—Clarify, by melting, 3lbs. of lump sugar; then, whilst boiling, pour in the juice of eighteen lemons and the grated peel of three. Boil three minutes, then strain through a cloth, and bottle up.

FRUIT SYRUPS.—Nearly all fruit syrups have cooling anti-febrile properties. The syrups of blackberry and elderberry are chiefly used in medical practice. A tablespoonful is a dose for a child, and a wineglassful for an adult. To make any fruit syrup, first prepare a simple syrup of 1lb. of sugar to each pint of water; add to each quart of that syrup one pint of strained juice of fruit, grate half a nutmeg and add to each quart of the mixture, boil fifteen minutes; add half a gill of best brandy to each quart of the syrup; stand till cold, and then bottle it.

CAUSES OF VARIATION IN THE BUTTER FAT PERCENTAGES OF MILK AND CREAM.

By G. S. THOMSON, N.D.D., GOVERNMENT DAIRY INSTRUCTOR.

As this subject has been freely discussed of late and various opinions expressed, it will be to the gain of suppliers and buttermakers alike to have an explanation given of the various causes that influence the quality of milk and cream.

The Cow.

Let us first of all consider the cow and her milk. Cows in good health and those that are well fed and well treated will give an almost equal daily quantity and quality of milk extending over a period of weeks. On the other hand, when they are either unhealthy or irregularly fed, and the quantities of feed insufficient to meet requirements, the milk yield and butter fat percentages will fluctuate morning and afternoon. Again, the hours of milking, times milked, and efficiency or otherwise of milkers will all influence very considerably the morning and afternoon quantity and richness of the yield. Let us discuss the hours of milking and see what results have already demonstrated. In experiments conducted cows were milked on three different farms at the following hours. (See *Journal of Agriculture*, July, 1901.)

	a.m.	p.m.
No. 1.....	3.45	and 3.45
No. 2.....	7	" 5
No. 3.....	5.30	" 12.30

For convenience we will take one cow in each lot, giving her average daily milk yield and butterfat percentage for one week of the test.

	Quantity of Milk.		Quality of Milk.	
	Morning.	Afternoon.	Morning.	Afternoon.
	lbs.	lbs.	per cent. fat.	per cent. fat.
No. 1	16	16	5.2	5.2
No. 2	5½	5	3.9	4.6
No. 3	8½	6	3.9	5.0

These extracts furnish evidence that the fluctuation principally occurred as a result of the hours of milking being unevenly balanced. What then must be the daily differences when there is a disregard of attention to other equally important factors. Take for example rough treatment of cows either immediately before or during the operation of milking. Experience has shown to everyone that heavy losses in quantity and quality of milk are sustained when a cow becomes nervous by fright, and these ruinous changes are recognised to be of almost immediate occurrence in the udder of the animal.

So strikingly injurious are they that in some instances the effects would seem incredible. Take this illustration as an example. Two cows were milked at 5 a.m. and 5 p.m. morning and afternoon; the following morning both were milked at the same hours, but, contrary to rules, the animals were hunted into their milking bails and otherwise roughly handled. The results of the evil practice will be found in the accompanying table:—

	Before Rough Usage.		After Rough Usage.	
	Quantity of Milk.		Quantity of Milk.	
	Morning.	Afternoon.	Morning.	Afternoon.
	Lbs.	Lbs.	Lbs.	Lbs.
No. 1	12½	11½	6	10
No. 2	9	9	5	8
	Per Cent. Fat.		Per Cent. Fat.	
No. 1	3.9	4	3.2	3.7
No. 2	4.1	4.2	3.1	3.8

Neglect to strip cows thoroughly will also reduce the butter-fat returns by a large percentage, and this is made clear when we consider the richness of the last milk (8 per cent.) compared to the first drawn (1.8 per cent.).—*Journal of Agriculture*, July, 1901.

Again, exposure to a cold night will so quickly alter the flow and fat-reading that by the next milking it may regain its former quantity and quality (proved by experiment).

Further, freshly calved cows will cause a change in the milk, and quantity of water consumed by animals in hot weather will have an almost immediate effect. There are other conditions at work that need not be mentioned, all of which possess an influence on the formation of milk in the udder of the cow.

On the above part of our subject, and before concluding, let me give a summary of the rules to be studied by owners of milking stock :—

- | | |
|-------------------------------------|--|
| 1. Breed. | 6. Protection against exposure. |
| 2. Feeding and changing of rations. | 7. Abundant supply of drinking water in hot weather. |
| 3. Hours of milking. | |
| 4. Kind treatment. | 8. Health of cows and freshly-calved animals. |
| 5. Efficient stripping. | |

The Separator.

To accomplish separation in a satisfactory manner attention must be devoted to the condition of the milk and to other requirements in the machine. So important are these conditions that a full explanation of each is necessary, but before doing this I will enumerate the points worthy of our consideration. Permit the numbers given to be a continuation of the rules already written and which will be extended to the conclusion of the article.

9. Solidity of foundation and working efficiency of separator.
10. Physical condition of milk and temperature.
11. Speed of separator and inflow of milk.
12. Practice of separation.
13. The uses of water or skim milk at conclusion of separation.
14. Alteration of cream screw.
15. Thickness of cream skimmed.
16. Warming the bowl before separation. (Note *Journal*, June, 1898.)

Rule 9 directs attention to a weakness that is not of uncommon occurrence, and where it exists uniformity in skimming will not be attained. Sometimes we again find that the parts of the separator are out of gear, and under such a circumstance, when the work is of so delicate a nature, variations in the cream returns must necessarily accrue.

Rule 10. It is universally recommended to separate milk immediately after it is taken from the cow, and why this should be so persistently advocated is because of the following reasons :—

- (a) The milk possesses a very fluid condition.
- (b) It is free from acidity.
- (c) It is not dense.
- (d) The fat globules are not dangerously grouped.
- (e) The adhering power of casein and other substances to the fat globules is decreased.

In cold milk we find exactly the opposite to the above, which at once explains the inability of the separator to accomplish clean skimming. Although to a less extent, we find when cold and warm milk are mixed together there is a loss in cream, but this does not happen in hot weather, being met with frequently in the colder temperatures of winter. In the summer time when milk is kept overnight and separated by itself in the following morning there is less

fat in the cream obtained, owing to a degree of acidity or sourness having developed, and an increase in the density of the milk. For this reason it is preferable to separate cold milk by itself at a time when the weather is unfavorable to a low degree of fermentation. We also suffer losses in our cream returns when milk is carted long distances before being passed through the separator, and jolting in carts and exposure of cans of milk to high temperature cause a condition in the milk that taxes the efficiency of separation to its utmost, and results in the abstraction of a considerable percentage of cream and butter fat. (See *Journal*, February, 1901, "Temperatures and Acidity of Milk.")

Rule 11. The speed of the bowl should not be less than the number of turns recommended by the manufacturers, otherwise a falling off in the revolving power will reduce the skimming qualities of the separator. The inflow of milk must not exceed the quantity that the bowl is capable of treating, otherwise excess of butterfat will pass away in the separator milk.

Rule 12. In separating, the operator should be particular to keep a continual flow of milk passing into the bowl, and not to stop or slacken speed because the receiver is empty. Arrangements should be carried out so that the receiver is never permitted to exhaust itself, and this will reduce the chances of loss.

Rule 13. When irregular quantities of water or skim milk are poured into the machine at the close of working the percentage of butterfat in the cream will suffer accordingly. Care should be devoted to the addition of regular quantities of separator milk, which will prevent interference with the quality of the cream, and is also preferable to the use of water.

Rule 14. As all owners and those engaged in the working of separators know that shifting the screw causes a variation in the thickness of the cream, it should not be practised except when there is a just and reasonable cause given.

Rule 15. The best results are got from cream containing from 25 per cent. to 30 per cent. of fat; beyond 40 per cent. the losses are considerable.

Rule 16. To prevent cream from adhering to the discs of machines and other parts of the bowl and escaping in the skim milk it is recommended to run a small quantity of warm water through before the addition of the milk.

Losses of Fat in Separator Milk.

In the Government butter test of January, 1900, eighteen analyses were made of the separator milk furnished by the competing factories, and out of that number the highest percentage of fat found was .045. It is of some importance to note that in this instance the milk was separated at the lowest temperature of all the factories. The cleanest skimmed sample showed .0025 per cent. fat, and the temperature of separation was 160° F., the milk in this case being pasteurised for a definite purpose.

Important Factors in the Separation of Milk.

- (a) Separate the milk as it comes from the cow.
- (b) When this is inconvenient heat up to 90° F. in cool weather.
- (c) Do not mix cold and hot milk together.
- (d) Milk that is over fifteen hours old in hot summer weather should be separated alone and unheated.
- (e) Have your separator firmly fixed and all parts in thorough working order.
- (f) Run a little warm water through the machine before separating the milk.
- (g) Regulate the inflow of milk.
- (h) Keep the receiver well filled throughout the whole period of working.

- (i) Do not alter the cream-screw more than is necessary, but skim an equal percentage of fat daily.
- (j) Be careful in the quantity of water or skim milk used in washing the cream out of the bowl.
- (k) Take down and thoroughly clean the parts of the machine at the close of each separation.
- (l) Put the parts together immediately before use.

Very Important Causes.

CREAM.

We now arrive at a stage that should command the attention and thought of all cream suppliers, and that is the age and mixing of cream and conveyance of same to factories. It is here where we attribute the heaviest losses, and it is to be regretted that many lose sight of the agencies that are working injuriously against the butter ratio of farmers' cream. Let the remaining portion of this paper be studied until a clear understanding is made of each factor explained, and when this is done the veil will be removed from the eyes of a few suppliers who have been laboring under a misconception of the truth surrounding the "mystery" of the variability in the butter return of cream. I will refrain from entering into the charges that have been made against butter manufacturers, and I sympathise with the farmers and manufacturers alike, on the ground that there are circumstances and conditions which are unfavorable to both parties concerned.

AGE OF CREAM.

The ripeness or degree of acid is a responsible factor in the butter ratio of cream. If the percentage or quantity of acid that has developed is high, churning will be irregular, and the chances of losses greater compared with cream that contains an average proportion of acid. Proof of this will be found in the table to follow, which illustrates thirteen successive tests that were made at one of our factories (*Journal*, February, 1901).

	Percentage of Acid in Cream and Churning.	Percentage of Fat in Buttermilk.	Temperature of Cream at Churning.
High ..	0.89	0.4	56° F.
	0.80	0.4	57° F.
	0.88	0.6	58° F.
	0.90	0.6	59° F.
	0.84	0.5	57° F.
	0.84	0.6	58° F.
	0.63	0.3	55° F.
Average..	0.56	0.2	56° F.
	0.57	0.2	56° F.
	0.57	0.2	56° F.
	0.55	0.2	56° F.
	0.55	0.2	56° F.
	0.55	0.2	56° F.
	0.65	0.3	55° F.

From these figures it will be gathered that the losses in fat are greater when the acid has exceeded 0.57 per cent., and this again is undoubtedly increased when the temperature of the cream at churning is high. In other experiments it was found that cream with 0.85 per cent. and 0.90 per cent. of acid did not lose much of its fat when the churning temperature was kept as low as 55° F. The above result, however, does not treat suppliers' quantities of cream, otherwise the fat losses would have been greater, caused by want of uniformity in ripening and increased age, which are conditions not usually found in the factory-treated product. It must be accepted by farmers that age seriously affects the butter returns of cream, and what must the losses be in some instances where cans of cream are sent many miles by road and rail and exposed to scorching hot weather. The bacteriological and chemical changes that are

produced, and which need not be explained here, work disaster in the composition of the cream, insomuch that refrigeration is unable to save a great part of the fat from passing away in the buttermilk.

MIXED CREAM AND BUTTER-MAKING.

Sweet and acid samples that have been mixed together shortly before churning will also lower the butter ratio, as the ripe cream will yield its globules of fat to be changed into butter sooner than the sweet cream. Just take an instance of sweet cream churning which is given in the report of the butter test of last year. It states as follows:—"Let us consider one example where the period of ripening occupied fourteen hours, and the time in churning twenty-three minutes. These few hours given to ripening, and a cool cellar selected for the keeping of the cream, one would naturally expect that the condition of the cream when put into the churn would be of a low acidity. This is confirmed by the 'practical' examination. From the knowledge that when sweet cream is churned fast a loss of butter fat follows, in the instance given we may attribute the loss to this cause, as the percentage of fat found in the buttermilk reached the high figure of 1.4." Now, assuming that this cream had been mixed with an acid quantity, what would have happened? Churning would have taken less than twenty-three minutes, and notwithstanding a low temperature the cream would not give up its fat in a way profitable to the supplier. In order to obtain equal results from two given quantities of cream, the following conditions must practically correspond at the time of churning:—

- | | |
|------------------------------------|------------------------|
| (a) Thickness of cream. | (f) Quantity churned. |
| (b) Percentage of fat. | (g) Speed of churn. |
| (c) Ripeness or degree of acidity. | (h) Washing of butter. |
| (d) Temperature at churning. | (i) Working of butter. |
| (e) Kind of churn. | |

(a) If the consistency differs there will be a variation in the fat percentage in the buttermilk, as thick cream under ordinary circumstances churns quickly, and the difference in time will influence the yield of butter obtained. (b) When one of two samples of equal weight or capacity contain more fat than the other, and both contain the same percentage of acid, and are treated in exactly the same manner, there will certainly be more butter got from one lot than the other. (c and a) Ripeness and temperature have already been explained. (e f g) Difference in make of churn and care in handling alter the butter ratio of cream. One churn might be too large or too small, and the concussion which accounts for the breaking of the cream into butter grains will accordingly vary, also the quantity churned, and the regularity in speed of churn will influence the freedom of the buttermilk from high fat percentages. (h and i) Over-washed or under-washed butter will raise or lower the weight of the finished product. A poorly-washed and half-worked quantity will increase the weight, while that which is freed from buttermilk, thoroughly drained in the churn and the water well worked out, will cause a lighter weight in the yield of butter. (See accompanying article on the percentages of water in butter.) In continuation of the rules already given in the first portion of the article, the following will complete the number:—

17. Cream must be equally ripened.
18. " must not be too thick or thin.
19. " must not be overheated.
20. " must not be sent in unfilled cans.
21. " must not be injured with preservatives.
22. " must be churned in a suitable churn.
23. " must be churned at a suitable temperature.
24. Butter must be carefully washed in the churn and also worked carefully.

In looking over these last rules I might draw attention to the dangers which accompany the transit of consignments of cream in partly-filled cans. When this is done, and the cream has to suffer shaking during long journeys, churning of the fat is sure to follow. This change is more marked in high temperatures, and which are so common in the heat of summer; and in the cold weather, I might remark that difficulty is experienced in getting the fat globules to unite, the cream showing a "sleepy" condition. This may also take place in summer when preservatives have been indiscriminately used, as the natural ripeness in cream is arrested, and the escape of fat in some cases must be unusually high, while the butter suffers in flavor. Unfortunately the practice of using preservatives is becoming very common, and there is much need for warning before serious damage is done to the butter industry. In concluding this paper, I hope all interested in this industry will study the subject carefully and do all in their power to minimise the losses that retard the progress of butter-making. Country factories should receive the support of their districts, as the less handling that cream receives the better for its butter ratio and the quality of the product manufactured.

It cannot be too generally known that the use of the most modern improvements in the equipment of our dairy factories—not the least important of which is the provision of refrigerating machinery and cool chambers—enhances the money value of the product dealt with, and saves serious losses in the aggregate returns from the dairy herd.

Lastly, let us admit that the supplier to any factory is in a sense at the mercy of the manufacturer; that the magnitude of his operations with milk and cream compels him to deal with the milk and cream of several suppliers at one operation; still, with his almost perfect system of tests, checks, and averages he should not recklessly be charged with unfair dealings if his returns to the supplier do not come up to wishes or expectations. There are so many factors tending to reduction of butter returns that suppliers are not justified in forming hasty conclusions that they being unfairly treated.

TAINTS AND FLAVORS IN DAIRY PRODUCE.

By G. S. THOMSON, N.D.D., GOVERNMENT DAIRY INSTRUCTOR.

The issuing of bulletins to milk and cream suppliers at intervals throughout the year has appealed to me as the best way of disseminating practical and theoretical information on the leading branches of dairying. As a consequence it is intended to forward the bulletins to the factories and creameries in sufficient numbers to meet the wants of farmers, so that no person need be without a copy. As a reward for the trouble and expense of writing and printing the leaflets it is to be hoped that suppliers will carefully study the suggestions given and put into practical effect all the recommendations for the better working of the industry.

In this publication we will deal with the subject of taints and flavors, giving an explanation of the causes of these unwelcome changes, which are recognised as the greatest and most costly evils affecting the success of factory dairying. But before proceeding with the paper the vital importance of the subject is sufficient to warrant a few remarks on the chief reasons contributing to the heavy losses sustained. So alarming have these losses been in the past that were it possible for us to have had a yearly estimate of the avoidable damage wrought in milk and cream it would cause much reflection on our past methods of handling the raw produce on the farm. The question may now be asked why have we neglected so serious a matter. The principal answer is because we have all along been too conservative in our pursuit of dairying, believing that old practices and principles were good enough for repetition in the time of keen

competition, when we are striving to gain a footing and establish a reputation among rival countries in the butter markets of the world. We forget that the results of competitive struggles has developed in human beings a delicate and sensitive palate, difficult to satisfy ; and until we meet with the approval and confidence of our customers at home and abroad the success which we are striving to attain will be seriously impeded. A second reason has been a want of opportunities whereby those in the industry could be made familiar with modern methods and teachings, but it will be a serious fault in the dairy farmer of to-day if he neglects to make use of the assistance which is now placed at his disposal in so many ways. Let it be clearly understood that the prosperity of the industry rests with the factory supplier, that he is chiefly responsible for the flavor or quality in our produce.

Flavor in Butter.

We can define a good flavor in butter as something that pleases the taste ; something that leaves a pure and delicate aroma of cream in the mouth. There is nothing that you can object to, no bitterness, no acidity, no stale or aged taste ; it is alone the flavor of choice butter - butter that has been made from choice cream separated from pure and carefully-handled milk. Now that it is understood that choice butter can only be made from the best of milk and cream, it will be well to explain what gives the butter its good, attractive taste. It is not chiefly the food that the cow consumes, neither is it the breed of cattle, but it is something that has been formed in the cream as a result of the care and cleanliness that the farmer has given to the handling of his supplies before being sent to the factory. The true answer is because the milk and cream have been kept free from the attacks of particles of dirt and unpleasant smells. But why should I use the word "attacks" in my answer ? Because the living organisms that produce the taints or bad flavors are always to be found clinging to the atoms of dust that fall into the milk or cream ; hence the great evil in dairying is neglect to keep our produce free from the attacks of germ-infested dirt. Smells also taint the raw product, not only when the milk and cream is cold, but also when it is warm and fresh. It is needful, then, to prevent the presence of any odor about the dairy that is objectionable to ourselves and proves hurtful to the quality in either butter or cheese. I will now classify in the order of importance all that is necessary to the manufacture of choice-flavored and good-keeping butter :—

1. Perfect cleanliness in milking.
2. Perfect cleanliness of milking-yards.
3. Perfect cleanliness of the utensils used for keeping the milk or cream in.
4. Perfect cleanliness of the room or place where the milk or cream is stored in.
5. Perfect freedom from objectionable smells in and around the dairy.
6. Skilled treatment of milk and cream before it reaches the factory.
7. Conveyance of milk and cream to the factory in a sweet and pure condition.
8. Purity of drinking-water for cows.
9. Freedom of taint—causing weeds and plants from the food of milking stock.
10. Skill in ripening cream and churning it into butter.

Let us consider rule No. 1. As much taint-producing "dirt" with its living organisms clinging to it is at liberty to fall into milk at this very important stage of dairy work, we recommend the adoption of simple practices in order to prevent the milk becoming soured or ill-flavored. What are these simple, practical, and preventive measures ? They are as follows :—

1. Milk after the udder and flank of the cow has been brushed and made damp with a clean cloth.

2. Milk after the teats have been washed.
3. Milk after the hands and clothes are clean.
4. Milk in a clean place.

In carrying out these recommendations there is nothing burdensome to be done, and the profits and good name that will be made by suppliers, factory, and industry will be a good reward. Little or no extra time will be required compared to the common and objectionable practices of to-day. A boy can precede the milkers and do the brushing and damping of the udder and flanks and washing of teats. Such a provision will leave the milkers free to do only one thing, thus avoiding as much of the dirty work as possible. The same person can provide water for the milkers to wash their hands in after finishing each cow; also clean supplies for moistening the hands during milking. I would suggest before finishing this bulletin that those engaged in milking should provide themselves with two or three cheap suits of white overalls that can be thrown on immediately before the operation is commenced and taken off immediately after it is over.

CO-OPERATIVE DAIRY FACTORIES AND PRIVATE SEPARATORS.

BY J. DAVIDSON, MURRUMBUM FACTORY.

As I was unfortunately absent from the late Agricultural Bureau Congress when the paper bearing the above title was read and discussed at some length and subsequently made the subject of discussion at several Branch Bureaus, it is fair I should be permitted opportunity for a short reply. The aim and object of my paper was to show the inadvisability of using separators in a district where a co-operative factory existed, which has a tendency to ruin them, inasmuch as their milk supply is affected. The Hon. A. W. Sandford, in opening the discussion, introduced points of debate which were not mentioned in the paper, and so clouded the main contention. No conflict was raised between the private separator and the factories. I only objected to its use within a certain radius of a factory. No mention was made against its usefulness to farmers at a distance where the machine has been of immense value to many a dairyman, and been the means of vastly increasing the output of butter. Isolated cases cannot be taken as evidence that first-class butter can be made from cream separated in various small lots and sent long distances. Following speakers so completely lost sight of the text of the paper as to infer I was opposed to the separator and in favour of the "old pan system," an opinion which would not be held by a man outside a bedlam. The advent of the hand separator undoubtedly is a great benefit to the industry, and every cow-keeper should have one, provided he is exiled by road or distance from a good factory; but when shareholders and others deliberately introduce machines at the doors of their factories, and withdraw their support, sending their cream away long distances, I then say separators are detrimental to the progress of the factories, the industry, and the production of a uniform article. The point was raised at the Burra Branch that better butter could be produced by the use of a private separator than at a factory. This is possible, but it does not always happen. Very rank-flavored butter is often found in this way. If the machine is properly cleansed, the cream skilfully ripened, and butter properly made, the product will be good. But how few properly manipulate and thoroughly clean their separators. The cream may be first class when separated, but for the lack of subsequent care in ripening and churning poor quality butter may be made.

NOTES FROM THE AGRICULTURAL COLLEGE.

The following items have been culled from the monthly report by the Acting Principal (Prof. A. J. Perkins) for period between October 8 and November 9, 1901 :—

The College.

Mr. George S. Thomson, N.D.D., has consented to deliver weekly courses of lectures on dairy stock and dairying, commencing on Wednesday, November 13.

Mr. Geo. Jeffrey, Wool Instructor, School of Mines, recommences a course of lectures on sheep and wool-classing about November 13.

Through the kind offices of Mr. Alick Murray, Mr. S. Ralli, of Werocata, was induced to give the students a very interesting and practical demonstration on the various methods of castrating colts. The animals operated on were six colts bred on the College farm.

Farm.

Ensilage-making was brought to a close towards the end of last month. Hay-cutting started on October 26, but had to be interrupted for a few days owing to rain. It will be completed early next week. Although some patches are exceedingly heavy, the yield on the whole will be lighter than last year. Red rust having spread somewhat rapidly over the late wheats, I have deemed it advisable to considerably reduce the grain plots, and to cut more for hay than would have otherwise been done.

Shearing, under the superintendence of Mr. Jeffrey, took place from the 18th to the 21st ultimo. Students of the third and second years alone took part in it.

The results were as follows :—

- 98 Merino ewes, averaging 10lbs. 9ozs. each.
- 68 Dorset Horn-Merino ewes, averaging 9lbs. 2ozs. each.
- 1 Merino ram, yielding 18lbs. 8ozs..
- 1 Romney Marsh ram, yielding 17lbs.
- 1 Dorset Horn ram, old, yielding 6lbs.
- 1 Dorset Horn ram, young, yielding 8lbs. 8ozs.
- 3 Merino ewe lambs, averaging 4lbs. 8ozs.
- 5 Merino-Romney Marsh lambs, averaging 4lbs.
- 24 Merino-Dorset Horn lambs, averaging 3lbs. 8ozs.

The Jersey bull not proving satisfactory, acting on the advice of Mr. Alick Murray, I asked the Central Agricultural Bureau to let us have the Government Jersey bull "Monarch," now stationed at Gumeracha. The Hon. Minister's approval has been secured. [Monarch has since been stationed at the college. —Ed.]

There being at the present time a greater number of cows on the College farm than we can conveniently keep in the dry season, Mr. Alick Murray very kindly consented, at very considerable trouble to himself, to come and pick out for me those most suitable to be kept. The others will be sold as occasion arises.

The pigsties being considerably out of order I am making arrangements to have them renovated. Instead of the jarrah railing previously used I am, on Professor Lowrie's parting advice, substituting low stone walls. I am also having the floor concreted and tarred, and drained by brick drains away from the yards.

Vineyard and Orchard.

The main work in vineyard and orchard during the past few weeks has consisted in scarifying; the soil is in perfect tilth, and as clean as could be expected.

The twenty odd acres which were planted with young vines benefited considerably by the October rains, and I count on a 90 per cent. take. This is refreshing after the previous years' failures. The growth throughout the old vineyard is luxuriant and strong, and the show of unopened flower-buds exceedingly heavy. Up to the present there is every indication of a very heavy crop.

The fruit trees are showing better growth than during the last few years. Apricots will not bear as heavily as usual, owing to stormy weather conditions that prevailed during the flowering season. Peaches, on the other hand, should yield a good average crop.

We have shipped to the London Depot a third consignment of wine, 18 hhd., twelve of which were red and six white.

THE DAIRY BOARD.

TUESDAY, NOVEMBER 19.

Present—Messrs. R. Caldwell, M.P. (Chairman), J. Watson, F. Hodby, J. Legg, A. Lipson, and W. L. Summers (Secretary).

Carriage of Produce.

The CHAIRMAN reported having interviewed the Railway Traffic Manager in reference to the cool cars, and said he believed everything had been satisfactorily arranged. The smallness of the traffic, particularly this season, was a drawback to getting greater facilities.

Mr. HODBY stated that when coming down to Adelaide he took particular notice of the handling of the produce in the cool cars at Petersburg, and was pleased to say that the railway officials took every care to transfer the butter for Broken Hill from one car to another as quickly as possible. He thought that cheese should be cased, and not sent loose in the trucks.

Mr. LEGG said the experience of the south-eastern shippers was that cased cheese suffered more than loose cheese, as it was not so carefully handled.

The CHAIRMAN said he never saw anything but cased cheese sent by rail in New Zealand.

Finances.

In reply to a question the SECRETARY said the expenditure of the Board for the current year amounted to £59, all except £10 being for railway fares of members.

Dairy Inspector.

Mr. HODBY thought the Board should not allow the question of dairy inspection to drop. With one exception, all the members were agreed that an independent inspector, competent also to instruct dairymen, was required, and that local inspection would not give satisfaction.

Mr. WATSON said that inspection was necessary in the interests of the public health. The Government should appoint a competent inspector, and pay the expenses out of the public funds. The purity and freedom from injurious matter of milk products was of far greater importance to the public at large

than was the question of the quality and strength of beer and spirits, yet it was thought necessary for a Government official to look after the latter matter.

It was decided that the Chairman should ascertain what was required, and what would be the expense of carrying out the inspection, and that the members should interview the Treasurer on the occasion of their next meeting.

Cheese.

Mr. LEGG tabled some cheese 15 months old, made at Blakiston. The cheese was sampled by members and found to be of first-class quality, sound, and of good color.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of November, 1901:—

Adelaide	0·87	Manoora	0·13	Macclesfield	0·91
Hawker	0·14	Hoyleton	0·26	Meadows	1·03
Craddock	0·10	Balaklava	0·21	Strathalbyn	0·79
Wilson	0·17	Port Wakefield	0·83	Callington	0·40
Gordon	0·12	Saddleworth	0·14	Langhorne's Bridge..	0·65
Quorn	0·18	Marrabel	0·27	Milang	0·91
Port Augusta	0·24	Riverton	0·24	Walleroo	0·55
Port Germein	0·11	Tarlee	0·38	Kadina	0·53
Port Pirie	0·03	Stockport	0·85	Moonta	0·59
Crystal Brook	—	Hamley Bridge	0·44	Green's Plains	0·45
Port Broughton	0·19	Kapunda	0·52	Maitland	0·91
Bute	0·20	Freeling	0·80	Ardrossan	0·60
Hammond	0·14	Stockwell	0·67	Port Victoria	0·95
Bruce	0·05	Nuriootpa	0·87	Curramulka	0·72
Wilmington	0·29	Angaston	0·62	Minlaton	0·61
Melrose	0·18	Tanunda	0·62	Stansbury	0·60
Booleroo Centre	0·60	Lyndoch	0·54	Warooka	1·10
Wirrabara	0·10	Mallala	0·68	Yorketown	0·51
Appila	0·15	Roseworthy	0·60	Edithburgh	0·57
Laura	0·09	Gawler	0·70	Fowler's Bay	0·53
Caltowie	0·36	Smithfield	0·63	Streaky Bay	0·28
Jamestown	0·21	Two Wells	0·84	Port Elliot	0·69
Gladstone	0·08	Virginia	0·65	Port Lincoln	1·14
Georgetown	0·06	Salisbury	0·53	Cowell	0·33
Narridy	0·17	Teatree Gully	1·01	Queenscliffe	0·80
Redhill	0·19	Magill	0·96	Port Elliot	0·74
Koolunga	0·17	Mitcham	0·88	Goolwa	0·73
Carrieton	0·06	Crafrers	1·08	Meningie	0·68
Eurelia	0·34	Clarendon	1·04	Kingston	0·53
Johnburgh	0·27	Morphett Vale	0·76	Robe	0·56
Oreroro	0·31	Noarlunga	0·63	Beachport	0·47
Black Rock	0·21	Willunga	0·97	Coonalpyn	0·45
Petersburg	0·14	Aldinga	0·97	Bordertown	0·24
Yongala	0·20	Normanville	0·90	Wolseley	0·20
Terowie	0·03	Yankalilla	1·13	Frances	0·40
Yarcowie	0·04	Eudunda	0·25	Naracoorte	0·57
Hallett	0·12	Truro	0·49	Lucindale	0·66
Mount Bryan	—	Mount Pleasant	0·75	Penola	0·75
Burra	0·02	Blumberg	0·99	Millicent	0·60
Snowtown	0·32	Gumeracha	1·21	Mount Gambier	1·08
Brinkworth	0·05	Lobethal	0·95	Wellington	0·45
Blyth	0·20	Woodside	0·98	Murray Bridge	0·46
Clare	0·23	Hahndorf	1·02	Mannum	0·39
Mintaro Central	0·21	Nairne	0·90	Morgan	0·38
Watervale	0·23	Mount Barker	1·05	Overland Corner	0·18
Auburn	0·17	Echunga	0·91	Renmark	0·48

WEATHER AND CROP REPORTS.

BALAKLAVA (November 21).—Wettest spring for past seven years. Rust is prevalent, and it is feared will injure the late kinds of wheat. Early wheats are just ripe, and the stripper is commencing work. Next week reaping will be general and only for rust crops would equal last year. A lot of hay has been cut through fear of rust. Several complete harvesters are at work in the district and appear to be giving satisfaction. Feed is ripening off. Orchards are looking better than for several years, but the fruit crop is light.

CARRINGTON (November 21).—The weather during the month to date has been very dry. The crops are ripening too fast, and the grain will be pinched. Feed is going off very fast. Locusts are doing damage in patches, especially where crops are thin and short. The returns in this district will only be light. Stock are in good condition.

COLTON (November 15).—The past fortnight brought unfavorable weather. Red rust is prevalent, and in some paddocks there will be no crops to reap. This is especially the case with very early and late sown, but the medium and fairly early will return fair yields.

CRYSTAL BROOK (November 21).—Haymaking is almost finished, and the yield has been fair. Red rust put in an appearance, and no doubt is responsible for more hay being cut than otherwise would have been done, but owing to the advanced state of the wheat most of the farmers do not anticipate the rust will do much harm. Reaping has, in a few cases, been started, and the splendid rain which fell at the end of last month should ensure a good return. Stock is in splendid condition, and feed is abundant.

GAWLER RIVER (November 18). Farmers are busily engaged with harvesting operations. A good area is being cut for hay. Over 2 tons per acre will be cut in some places. Red rust has made its appearance in a good many crops, causing a larger area to be cut for hay than would otherwise have been the case. Early varieties are too far advanced to be much affected, but its influence on the later varieties is more to be feared. Apricot crops are likely to be light; peaches good. Apples and pears are somewhat irregular. Vines are showing well.

INKERMAN (November 25).—Reaping is now general. The yield on the whole is fair, although red rust has done a lot of damage in patches, especially on drift sand. The seed drill and manure have again shown considerable advantage over broadcast. Some of the latter is scarcely worth reaping. Feed is plentiful, but water on some farms is scarce.

JOHNSBURG (November 25).—The stripper will be in action this week in a few fields, but will not be general for another week or ten days. The weather during the past three weeks has been very hot, and has had a most depressing effect on the crops, as the grain will be much shrivelled, and the average reduced accordingly. The district may average 3bush. per acre. Rust is showing on some of the very late wheat, mostly on low-lying land, but will not do much harm. Apparently only early wheats will succeed in this district.

MALLALA (November 18).—Hay-cutting is practically over and on fallow the yield is fairly good, but a long way short of last year on stubble land. Red rust is here, but not as bad as reported in some other places. It is thought the best of the wheat crops will be a little pinched. From three to four bags is as much as can be expected from the best.

MELROSE (November 26).—Red rust is prevalent in parts of this district. A larger portion of the wheat than usual is being cut for hay. The weather has been very favorable for hay-making, and the wheat crops give promise of a fair average yield. Stock are in good condition. Rainfall since October 25, 1.44 in.

NANTAWARRA (November 25).—The weather during the month has been very changeable. Haymaking and carting is in most cases quite finished, and reaping is general. It is rather early to say what the yield will be, but the quality is good. Red rust made itself shown, but only the very late wheats will be affected. Stock of all kinds are looking well. Rainfall for month to date, 0.27in.; and for year, 14.34in.

ORROROO (November 23).—The weather is all that could be desired. Haymaking is general. The cut is larger than for the past eight or ten years. Reaping will be in full swing in a fortnight. The yield will be better than for the past seven years. Locusts are very numerous, but the damage is not so great as in former years.

PTAP (November 18).—Weather very changeable. Hot and windy days have been followed by cool changes and thunderstorms. Little rain has fallen for this month. Hay-making is closing and reaping is about to commence.

SADDELEWORTH (November 25).—The sultry weather of the past few weeks was most favorable for the development of red rust, which has spread to an alarming extent. A very large area of wheat is being cut for hay. Among early wheats, Steinwedel, Allora, and King's Early will probably escape much injury, though rusty. Marshall's No. 3 and Field Marshal, and, to a lesser extent, White Essex and Tuscan, are resisting the rust, the two former only very slightly affected. Feed is abundant. Stock healthy and in good condition. Slight frost on night of 20th, but did not injure the young sorghum.

SWAN REACH (November 20).—Haymaking is drawing to a close. Reaping will start this week on some farms. The crops will be light for the hundred of Nildottie. We have had some thunder and vivid lightning, but no damage is done as yet. There was not very much rain, but has been very windy for haymaking. The wind is knocking out the early wheats and oats.

WILSON (November 28).—Rainfall for month to date is only 0·17in. The lack of moisture at the close of the critical time has caused the wheat to ripen fast, and the grain is expected to be very small. The average yield will not exceed 2bush.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Company report :—

December 2, 1901.

The weather during November was somewhat cool, excepting for a couple of short but fierce hot spells; still, the climatic conditions were not as favorable as could be desired. The rainfall was up to average and fell in light showers now and then, between which humid conditions prevailed, so that in many places rust attacked the wheat plant with such rapidity that in a few days crops which had promised well for 15bush to 18bush, became valueless. It is hoped the areas affected do not extend very widely, and there is over a large portion of our agricultural districts quite an average wheat crop being reaped, whilst in the late parts the outlook favors a good yield. In most pastoral districts the season continues favorable for feed and water.

Business is steady, but the many alterations that are being made in the federal tariff, and the uncertainties as to the final adjustment, is much restricting trade and thus causing losses to distributors as well as importers. Fair progress can be reported in some of the new copper mining ventures, where the output is being increased, but the scarcity of water seriously retards development on the new goldfields at Tarcoola, where some high average crushings have, however, been reported.

In the local breadstuffs market trade during the month has been very dull. Old wheat is running low in stock, and new hardly yet being delivered in merchantable quantities. By some in the trade it is feared that the red rust may cause more damage than was anticipated, and the knowledge that some of the best crops have been cut down for hay to save greater loss leaves it uncertain as to whether the yield of wheat estimated a few weeks ago will be realised. This is causing shippers to hold off chartering and making future delivery purchases, so that we have heard of little fresh business and no speculation. The European markets continue fairly firm, the latest transactions in Australian being a couple of cargoes from this State, which have been sold at 29s. 3d., and an afloat shipment in sailer from Victoria at same figure, and there is reported the sale of a cargo now loading at Port Adelaide at 29s. c.i.f., United Kingdom, for orders, with usual continental options; but the absence of any speculative spirit on the part of foreign buyers we fear indicates no great confidence in the future of the world's wheat market. Melbourne has reported from time to time a fairly active market at a shade higher than the Adelaide rates, but Sydney continued dull. In flour, sales mostly consisted in miller's contracts being filled, very little new business doing. South Africa at moment is not an anxious buyer, and is offering prices that must prove unprofitable to millers when compared with ruling wheat rates, shows that the flour trade there is not very brisk. Business in forage is stagnant, the plentifulness of growing feed and unexpected addition to the hay yield through the cutting of rusty crops seems to be deterring speculators from operating; this is hardly to be wondered at owing to the dearth of export orders. In feeding grains nominally low prices are quoted, but the trade is really waiting to see how the Victorian markets will open in oats and barley under the altered conditions of inter-State freetrade.

Values of potatoes have dropped quite 50 per cent. during the month under the influence of steadily-increasing deliveries of locals and the importation of a few parcels of Victorian earlies, which latter, however, landing here green and somewhat bruised, made them difficult to quit even at a considerable reduction on rates ruling for locals. A few lots of old season's New Zealand still remain unsold, and are being reoffered cheap for cattle feed. In onions new locals grown on the plains began to come on the market at £7 10s., but quantities increasing these also gave way, and are now plentiful at half the opening prices. Most of the white-skinned have been disposed of, and browns are now offering freely.

Heavy business doing in dairy products, but the exportable surplus of butter has proved disappointingly short, and may be expected to cease in a week or two, as evidently we have now passed the flush of milk supply for this season. Values in butter held firm during the month, and may be expected to steadily advance as we come under the influence of Christmas trade. The slight easing in the value of eggs owing to heavy supplies was promptly met by increased Sydney and Melbourne orders, so that price again is inclined upward, though quantities coming forward are unusually heavy. There is, as usual at this time of year, an inclination on the part of some cheesemakers to sell very freely, but the newness of local samples is

forcing demand more on matured New Zealand, in which there is good trade doing, somewhat to the neglect of the local product, though stocks of these are not heavy, and makers need not fear as to future quittance. Bacon and hams have had brisk attention at hardening rates. Honey rules very quiet. Almonds scarce.

Full catalogues of poultry have been submitted at each auction sale, but demand was much ahead of supply, exporters being unable to secure even a tithe of their wants at the high ruling rates.

MARKET QUOTATIONS OF THE DAY.

Wheat.—Port Adelaide shipping parcels, old, 2s. 10d. to 2s. 10d $\frac{1}{2}$; new f.a.q., 2s. 9d. per bushel of 60lbs.

Flour.—City brands, £6 7s. 6d. to £6 15s.; country, £5 7s. 6d. to £6 2s. 6d. per ton of 2,000lbs.

Bran.—9d. to 9 $\frac{1}{2}$ d. per bushel; pollard, 9 $\frac{1}{2}$ d. to 10d. per bushel of 20lbs.

Oats.—Local Algerian and dun, 1s. 8d. to 2s.; prime stout feeding white, 2s. 3d. to 2s. 6d. per bushel of 40lbs.

Barley.—Malting, 3s. to 3s. 3d.; Cape, nominal at 2s. per bushel of 50lbs.

Chaff.—£3 to £3 5s. per ton of 2,240lbs., bags in, dumped, f.o.b., Port Adelaide.

Potatoes.—New locals, £6 to £6 10s.; Victorian, £4 10s. to £5 per 2,240lbs.

Onions.—Local brown skins, £3 per 2,240lbs.

Butter.—Creamery and factory prints, 9 $\frac{1}{2}$ d. to 10 $\frac{1}{2}$ d.; private separator and best dairy, 8 $\frac{1}{2}$ d. to 9 $\frac{1}{2}$ d.; good store and collectors', 7d. to 8d.

Cheese.—South Australian factory, 6d. to 7d.; New Zealand, 9 $\frac{1}{2}$ d. per pound.

Bacon.—Factory-cured sides, 7 $\frac{1}{2}$ d. to 8d.; farm lots, 6 $\frac{1}{2}$ d. to 7d. per pound.

Hams.—South Australian factory, 8 $\frac{1}{2}$ d. to 9 $\frac{1}{2}$ d. per pound.

Eggs.—Loose, 6 $\frac{1}{2}$ d.; in casks, f.o.b., 8d. per dozen.

Lard.—In bladders, 6d.; tins, 5 $\frac{1}{2}$ d. per pound.

Honey.—2 $\frac{1}{2}$ d. for best extracted, in 60lb. tins; beeswax, 1s. 1d. per pound.

Almonds.—Soft shells, 6 $\frac{1}{2}$ d.; kernels, 1s. 2d. per pound.

Poultry.—In live poultry bright table roosters sell from 2s. to 2s. 6d. each; ordinary cockerels and good hens, 1s. 7d. to 1s. 10d.; a few light birds, 1s. 4d. to 1s. 6d.; ducks, from 1s. 7d. to 2s. 2d.; pigeons, 6 $\frac{1}{2}$ d.; geese in very brisk demand, 3s. 6d. to 4s. 6d.; turkeys from 6d. to 8d. per pound live weight for poor to medium; prime table birds worth up to 10d. per pound live weight.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, flour, and forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese.

RINGWORM ON STOCK.—This disease is caused by a fungus, and is contagious. The botanical name of ringworm is *Herpes tonsurans*. The cure is easy if taken in hand soon after its appearance. Wash the places with soft soap first, and then dress three times a week with chloride of zinc ointment, or use a mixture of equal parts of sulphur, stockholm tar, and oil.

WORMS IN SHEEP (STOMACH, INTESTINAL, AND LUNG WORMS).—Mix 1pt. (20 fluid ozs.) of turpentine with 2pts. of raw linseed oil or milk, and give sheep 3ozs., weaners, 2ozs. If weak, use a smaller dose. The ingredients must be kept thoroughly mixed. The dose should be repeated at intervals of from seven to ten days. Or boil $\frac{1}{2}$ lb. tobacco in $\frac{1}{2}$ gall. of water and strain; boil 5lbs. sulphur and 5lbs. lime in 10galls. of water for about thirty minutes; mix these together and give sheep 2ozs. and lambs 1oz. Drenches should be given on an empty stomach. Yard the sheep the evening before it is given, and do not let them have water or food for three or four hours after drenching. A second drench may be given seven or ten days afterwards. To keep sheep healthy it is necessary that they should be supplied with a sufficient quantity of saline food. If this is wanting in the pasture it must be supplied artificially. Two good licks are—(1) 10lbs. common salt (not rock), and 1lb. sulphate of iron, well mixed; and (2) 1pt. of turpentine added to from 25lbs. to 50lbs. of salt. This last mixture should be placed in small quantities so that it is quickly consumed. All licks should be placed in troughs, which should be protected from rain by small open sheds. Quicklime in waterholes and troughs is very important.

CONFERENCE OF BRANCHES AT GUMERACHA.

As was agreed at the latest Conference of Murray River Branches at Mannum, a Conference of River and neighboring Branches was called to meet at Gumeracha Institute Hall on Thursday and Friday, November 7 and 8; but, after all, none of the River Branches were represented in person, although Mr. Schuetze, of Mannum, sent a paper with a "reasonable apology" for his absence. Members from the following Branches were present:—Gumeracha: Messrs. D. Hanna, W. Cornish, W. Jamieson, W. J. Hannaford, H. W. Nosworthy, J. Kitto, A. R. Lee, W. A. Lee, A. Moore, and Dr. Stephens. Mount Pleasant: Messrs. G. Phillis and F. Thomson. Angaston: Messrs. J. Swann and F. Thorne. Forest Range: Messrs. G. Monks and R. Townsend. Golden Grove: Mr. R. C. Smith. Visitors included Mr. R. Marshall, Mr. G. Quinn, and the General Secretary from the Central Bureau.

On arrival the assembled delegates were driven around the district by the members of the Gumeracha Branch. Those interested in general farming were driven around the northern end of the district to see the wheat and hay crops. Others more interested in fruit-growing and dairying were taken around the Cudlee Creek and Kenton Valley districts. Throughout the districts the feed was in a healthy, flourishing condition, and stock apparently thriving. The crops of hay were somewhat late; peas in many places showed for a fine yield. In the old orchards the *Fusicladiums* had worked havoc among the apple and pear trees. Even in those sprayed with Bordeaux mixture its ravages were severe. This was attributed to the peculiarly favorable conditions for fungi which had prevailed. In consequence of this disease the promise for a fair crop of apples is remote. It was gratifying to note the increasing area devoted to apple culture, young orchards being plentiful upon the hillsides. The delegates from other localities were much interested, and appreciated the opportunity thus afforded of seeing the conditions under which the industries of the neighborhood are conducted.

At 2 p.m. the delegates and visitors assembled in the Institute Hall, and Mr. D. Hanna presided.

The CHAIRMAN, in welcoming the delegates, referred to the dryness of the season, but spoke hopefully of the prospects after the late rains. The results of manuring were working a revolution in farming in all parts of South Australia. The dairying industry had suffered, owing to the late arrival of the winter rains, and even in such a favored district as theirs some cows had died, and others were only saved by being fed on bran and chaff. The returns of butter were low, but the prices had been better, and this compensated them to a certain extent. The herds were improved since the establishment of the factories. The production of fruit was also progressing, although they had to compete against pests. This may prove a blessing in disguise. The export of fruit had been a good help, and he hoped the growers would maintain their good name for first-class fruits. The wool-producers had low prices at present, and the mining industry suffered from low prices for lead and silver. He hoped Tarcoola goldfields would prove permanent, as a good goldfield would be of great help to the State.

Fruit Storehouses.

Mr. G. Monks, of Forest Range, then read a paper as follows:—

Before the advent of the codlin moth almost any kind of a storehouse, provided it was fairly water-tight, was good enough to store fruit in for the purposes of keeping through the winter, but since the arrival of the pest the growers are, in some cases, racking their brains as to what kind of fruithouses would be the most useful, the most effective, and at the same time the cheapest to build under existing conditions. Whatever opinions may be held as to

details in connection with such storehouses, it must be patent to all that those old-fashioned bunks, used in most instances at present, must be dispensed with if the moth is to be dealt with, as it must be if it is to be kept in check sufficient to enable growers to get anything like a fair percentage of clean fruit the following season. Undoubtedly, there is a big leakage from the storehouses under existing conditions. I will admit that careful growers do not take any caterpillars in with the fruit if they can help it, but the fact remains that, with all their care they get there just the same; and, this being the case, how is it possible to deal with the trouble unless some better mode of storing the fruit is resorted to? The question is, What is that better way? And I feel convinced the answer is in building better houses and storing in cases—either banana, kerosine, or any other suitable for the purpose. The former can be bought at about twopence each, whilst the kerosine cases cost from sixpence upwards. The benefits of this system are saving of labor, because the grower would save at least twice, if not more in handling the fruit, as all he would require to do when picking would be to pick into the cases from the trees, then carry into the storehouse and pack away where required to remain; and when he wished to market them all that would have to be done would be to sort out of the storage cases into others for marketing purposes; whereas with the bunk system the fruit must either be handled twice, or handled once and tipped once before it reaches the bunks, and when packing from them for marketing it often takes twice handling before that is accomplished. Another great advantage is the facility, saving of time, and ease with which the fruit can be handled in this way, compared with the bunk system. The storehouses if required could also be utilised in the off season for any other storage purposes, but when fitted up with the old-fashioned, cumbersome bunks, they are very little use for anything else. But the greatest benefit of all would be the facility with which the codlin moth can be dealt with. The cases can either be dipped in scalding water, or fumigated with sulphur, and the storehouse can be closed up, and the moths caught. Instead of, as is the case at present, escaping to lay their eggs upon the young fruit in the orchard. But in order to do this the fruithouse must be constructed upon proper principles, and the walls must be built of either stone, brick, or concrete, properly ceiled with either lath and plaster, or ceiling iron; inside of walls at least one coat of plaster; floors either brick or concrete; one door at each end, and these should be sliding doors so as to take up as little space as possible; and at least two windows in each side, so as to admit plenty of light, and also to see to trap the moths as they emerge—as they make for them. There should also be plenty of adjustable ventilation, so as to admit plenty of fresh air around the fruit; also, so as to be easily and securely closed up when all the fruit is marketed. A storehouse 25ft. long, 15ft. wide, and 8ft. high from floor to ceiling, allowing 6in. clear at the ceiling, will hold, without any alleyways or spaces for doors, 720 banana cases, and as each case will contain $2\frac{1}{2}$ bushels of fruit, 1,620 could be packed within this area. The dimensions of this case are 2ft. 6in. long, 1ft. 3in. high, and 1ft. 3in. wide about; that is ten cases in length, twelve cases in width, and six cases in height. A building 35ft. long, 15ft. wide, and 7ft. 6in. in height from floor to ceiling, allowing only 3in. clear at the ceiling, would hold 2,160 kerosine cases or bushels of fruit—that is twenty cases in length, eighteen cases in width, and six cases in height—not providing, of course, for alleyways or any other spaces. The dimensions of these cases are about 21in. long, 14 $\frac{1}{2}$ in. high, and 10in. wide. The former cases would require two men to handle them, whilst the latter could be handled by one. I have not provided for any alleyways or gangways, but each grower could do so to suit himself. I think, however, that at least three would be required—one down the centre lengthwise, and one on each side, equally divided between the walls and the centre. I also think that one case and a half would be sufficient in width for each alleyway; that would allow plenty of room for carrying or removing a case, and that is quite as much as is absolutely necessary.

Mr. CORNISH asked whether Mr. Monks would prefer a lighted room for storing fruits?—Mr. Monks said he believed experience had proved that windows were an advantage, as the codlin moths flew to the windows to try to escape.

Mr. CORNISH—Will not fruit ripen prematurely in lighted rooms?

Mr. QUINN said light most certainly hastened the ripening of fruits.

Mr. VICARS thought there should not be any air-bricks and the windows should be covered with perforated zinc, and cover them with blinds to stop the admission of light. He suggested covering the windows with "stick fast." The cases could be scalded after they were empty. He believed more moths were bred in the "bunks" than lived over the winter in the orchards, as more larvæ were collected in slabs in the storerooms than in the trees. This was proved by the splits in the limbs of the trees. The case system saved a second handling, which bruised the fruits. The dust was also avoided, which disfigured the fruits. He advocated two alleyways in the storeroom.

Mr. W. HANNAFORD supported the need for more attention being given to the houses. The bulking of the fruit under the bunk system assisted in keeping the fruits from wilting providing they were picked at the right time. Slight bruises were not of much importance if the apples were not too ripe, as the "spot" dried up quickly, and did not rot. He believed in the "case-storing system," but feared in the future, owing to kerosene being imported in bulk, that the general adoption of the system would be costly, owing to the increased cost of cases. He considered it a mistake to store the fruits in an elevated position, as they shrivelled more in consequence.

Mr. S. HANNAFORD asked how the moths could be shut in altogether?

Mr. MONKS believed if the fruits were stored in a cellar the moths would not develop for a season longer. He had known the caterpillars to be found very late in the season still unhatched in such places.

Mr. S. HANNAFORD had practised the storing of apples in kerosene cases and found it a great success. He disinfected the cases, when empty, with sulphur fumes in a close chamber.

Mr. W. JAMIESON, M.P., asked why the moths made for the windows, as he understood many persons believed the moths to be blind?

Mr. MONKS said practical experience proved that they collected in the windows, and the inference was that their instinct prompted them to seek the light windows as a possible means of exit to the open air. The doors and ventilators should not possess crevices through which caterpillars could escape.

Mr. MOLINEUX advocated the use of "tanglefoot" on the windowsills. He believed this would be the simplest method of killing the moth.

Mr. MOORE welcomed the paper as an interesting subject. He believed prevention was better than cure. He always tried to take as few caterpillars as possible into the house with the apples, and he preferred handling the fruits twice to attain this end. He favored storing apples in cases, but recognised the difficulty in procuring them. If possible the stores should be a long way distant from the orchard. It is a common mistake to place the house in the garden. His experience was to the effect that if the moths had to travel only a couple of hundred yards across the scrub or open land to reach the apple trees they were placed at a disadvantage. The rendering of old houses mothtight was involving many in expense. If stored in the cases nine-tenths of the caterpillars spinned themselves up in the crevices of the boxes.

Mr. JAMIESON asked if the old methods of storing potatoes would act for storing apples? The straw used could be burnt when the apples were removed.

Mr. MONKS believed the apples stored thus would keep, and as far as destroying the caterpillar was concerned, it would be more effective than the wretched slab houses full of holes and the old system of bunks used in them.

Mr. S. HANNAFORD had tried storing of apples by putting planks on the ground and then putting a layer of straw on them. The apples were then piled about 2ft. deep. Straw was then piled over them and a roof of galvanized iron placed over the top.

Mr. JAMIESON suggested overcoming the scarcity of cases by the growers combining and securing kerosene cases in the northern townships.

Mr. QUINN described a storehouse he had seen at Port Elliott. Instead of the bench system the shelves were made of suspended wire-netting. Straw was spread on the netting, and the apples rested thereon in a deep layer. When the fruits were removed the straw was burnt. The whole rested upon strained wires, and no slabs were present to afford harbor for caterpillars. The house was partly beneath the surface, and a close thatch roof well away from the shelves covered it. Over this a galvanized iron roof was fixed.

Dr. STEPHENS said the only way out of the difficulty of increased prices for

cases would be to develop the timber industry of Australia. Queensland had fine timber for the purpose of box-making. He had used it in shed-building, and a kind of pine found there was very durable.

Mr. THORNE thought it was useless to build houses to destroy moths if they were breeding them in other ways. He knew an instance at Nuriootpa where a large and practical grower had coped with codlin moth for several years, and the grower said it had never increased to any extent. The methods he followed had been bandaging and cutting away the split ends of branches, and kept the trees and soil clean throughout. We must cope with the pest if the apple-growing industry is to flourish. In his district (Angaston) the growers exported more fruit than they stored.

Mr. CORNISH said he had tasted good cider in Tasmania made from the codlin-damaged apples. He advocated the making of cider and vinegar here out of fruits of the same character.

Mr. SWAN (Angaston) thought the practice of allowing grass and weeds to grow under apple trees, as they had seen that morning in many gardens, was a mistake, and he suspected such a condition favorable to the pest. In Tasmania he had been shown how they dealt with the moth in the commercial orchards. They placed great importance on picking off the infested fruits. These were boiled down with pig food. He did not think the attention to storehouses will be of much avail unless the orchards are kept cleaner. He recommended exporting the apples direct from the trees. Last year many buyers came around their district and bought the apples and packed them in the district. One packer said he had only found about half a case of infested fruits out of 3,000bush. or 4,000bush. packed for England. The moth had been brought into their district in the cases to the factory. The growers, however, took time by the forelock and cleaned their trees. In Angaston district the stored fruits were placed on board floors and in lofts above stables.

Mr. MONKS, in reply, said he agreed in keeping the orchards as clean as possible. It was a necessary adjunct to good stores, and one link in the great chain of preventive action. The infested fruits should also be picked and destroyed. In this respect the newer districts, such as Angaston, possessed advantages which facilitated such work. In the old districts, such as in the Mount Lofty Ranges, the fruitgrowers were producers of "timber" trees in their gardens, and this combined with the steepness of the hillsides increases the difficulty of proper attention. The moth is established throughout the Hills, and we have to meet the difficulty as best we can. If we exported our fruits straight away the evil would be reduced in the garden, but our reputation as suppliers of first-class sound fruits might suffer. He had come to the conclusion that unless the size of the trees was reduced we would never cope with the moth as effectively as the Tasmanian commercial orchardists were doing.

The Codlin Moth Question.

Owing to a misunderstanding the paper by Mr. Cornish was not to hand, and it was decided to discuss the "*Codlin moth question in its general aspects.*"

Mr. G. QUINN, the Chief Inspector under the Vine, Fruit, and Vegetable Protection Act, was asked to open the discussion, and said the codlin moth trouble had evidently come to stay. The insects had slowly but surely spread through many districts until they had become thoroughly infested. The same course would doubtless follow with those districts now comparatively or wholly free of its presence. This may be a pessimistic view of the matter, but he believed time would prove it to be correct. Doubtless the spread of the insect could be retarded by the general adoption of precautionary measures. Unfortunately there existed the careless or thoughtless among all occupations, and fruitgrowers were no exception to this rule. As a result of this the pest would

eventually reach most isolated places. Although he was chiefly concerned about the legislation dealing with the subject, he also looked at it from a horticultural point of view. He believed, no matter how much they might disagree about details, they would all allow that the pest must be attended to if we are to develop our fruit-growing industry. While some persons did not believe in legal intervention, he believed the majority of the growers would be in favor of a properly-constructed law. Persuasion was a powerful weapon, but it would not keep away the moths from a careless neighbor's orchard. We had, therefore, to face a difficulty, and the best way to overcome it was to meet it in the presence of all the facts. In the first place we should ask ourselves if the industry of apple-growing is worth fostering and pursuing? If it is, then the codlin moth trouble must be counted in the yearly routine of labor in producing the fruit. The experience gained in other places indicated that all other cultural operations must conform to the requirements of the codlin moth suppressive work. This is indicated in the reduction of the height of our trees, and in the cleanly condition of the trees and soil, consistent with reducing the harboring places for the pest. That all our other operations in the apple orchard must be carried on with the codlin moth pest perpetually in mind, is proved by the fact that no matter how well we plant, till, or prune our trees, and bring forth large crops of fine fruit, this insect, if not attended to all through, will, at the eleventh hour, ruin or take the profit from all of our work. He thought this was self-evident to every person who was unfortunate enough to have had practical experience with the pest. In the administration of the law in the past he had endeavored to follow upon the lines of educational work, and the stimulation of self-interest, rather than legal pressure. He had tried this policy up to the very snapping point of endurance. In the future, if entrusted with the work, he intended to use less persuasion and more legal pressure. The present law was passed in 1885, and although a well framed Act, considering the lack of experience of the framers at that time, it required amending. Some of its provisions were not sufficiently clear, others were too complicated, and trammelled with the routine of that period. To meet the exigencies of the present day the law should be clear and decisive in its provisions. With a view to meeting these requirements he had recently gone into the matter with the Crown law officers, and he believed, if the bill as prepared became law, we would then have a statute which, while safeguarding clean districts and preventing the entrance of new pests into the State in general, would meet the needs of even the well-meaning grower in infested districts. The great cause of dissension was the disposal of the infested fruits. He believed no relaxation of the law should be tolerated which would make it worth the while of any orchardist to allow his fruit to become infested; in other words, having any more infested fruits than he could avoid. In some districts, at any rate, some use could be made of the damaged article. Those districts were the badly infested ones, where, practically, every orchard was attacked. In clean districts, or those in which the pest held but a minor position, the infested fruit should not be permitted to leave the infested orchards. The reason for this was obvious when the slow natural spread of the insect is borne in mind. He always contended it was not in the true conservative interest of the grower to sell damaged fruit—even as damaged fruit—in competition with good sound fruit. At the prices at which the bulk of the codlin damaged fruit could be sold to repay the grower for cartage and manipulation, they would prove much more costly to the unfortunate consumer than sound fruit. The "poor" consumer, who, it is now asserted, asks for cheap (meaning infested) fruits, would soon discover the discrepancy, and then the closing of his purse strings, or the changing of his tastes, would most certainly react upon the producer. In the recently-prepared Bill provision had been made for permitting the utilisation of the injured fruits,

under conditions to be named in each individual case. The reason this had been inserted was to permit any grower, or combination of growers, to utilise the injured fruits under certain regulations, for the purpose of making vinegar, or cider, or pulp, or dried fruits, or even to establish piggeries, where the fruit may be boiled down with other pig food. Such establishments could possibly afford to pay the grower a small sum per bushel, and this in turn would pay for the attention to the damaged fruit and the pest. Given a return for the infested fruit sufficient to cover its handling, and there would be no incentive or reason for any grower allowing them to lie upon the ground, or to take them to the markets and there foolishly put them into competition with his own sound apples and pears. The Bill also made provision for the defining of fruit-growing districts and the election of local boards, who should have power to levy rates on orchard lands, the funds thus collected to be used in compensating the owners of orchards the fruit in which it might be deemed necessary to destroy, with a view to eradicating the pest. This might be availed of by clean districts to deal with the first outbreaks of codlin moth. He believed it was only a matter of time when those persons who neglected their apple and pear trees, to the detriment of their neighbors' interests, would cease to possess trees of these kinds. In the Hills, near Adelaide, trees had been set out on almost inaccessible steep slopes. These must inevitably pass out of competition when met by the full crops of the younger plantations on less difficult country, where every operation could be performed by labor-saving machinery. Personally, he believed there were great possibilities before the fruit-growing industry in South Australia, and true statesmanship in the handling of questions such as this will go a long way toward fostering its development.

Mr. MOLINEUX said South Australia produced apples of most excellent quality. At an intercolonial fruitgrowers' conference, held at Hobart in 1895, he had shown forty-two varieties, and they were superior to any shown there. The possibilities for the industry were great, and large areas had been planted for export. Some people who wished to sell infested fruit said, "the poor people in cities wanted the infested fruits cheap." If these persons had done all they should have done to mitigate the pest they would not have so much infested fruit. He did not consider the damaged fruit was cheap. We want more export and more trade in apples, but if this pest increases it would affect the industry severely. Mr. Young had called attention to the infested fruits that had arrived at the Produce Dépôt, in London. Certainly the quantity had been small, but it was sufficient to damage our reputation if persisted in. Carelessness was damaging the reputation of the Tasmanian fruit in London.

Mr. W. HANNAFORD did not altogether agree with the former speakers. He had come to the conclusion that the bulk of the fruit was not injured too much for immediate use. He considered little harm resulted from selling them in Adelaide, or in the north, as these were not apple-growing localities. (Mr. Molineux—"What about the boxes and bags going from these places into apple-growing districts?") As for making vinegar, they had made it for years. It was of good quality—suitable for pickles and preserves, and it could be made cheaply. As long, however, as our laws allowed concocted rubbish to be sold as pure vinegar, the apple vinegar industry would not get a footing.

Mr. CORNISH said he understood Mr. Quinn to say he would not be so lenient as in the past. Would not this be detrimental to the colony if poor people were not allowed to sell the infested fruits? If not permitted to sell they should not be permitted to give it away as was now done. He was at a loss to know what injury would result to our trade by sending our infested apples to England, as the pest was there everywhere, and they had failed to destroy it. It was likewise all over America and the Australian colonies. He

had planted over a thousand trees recently, and was inclined to regret having done so. He thought preventing the selling of the infested fruits would do a lot of harm to the State. The pest would never be destroyed.

Dr. STEVENS advocated feeding horses and pigs upon the infested fruits. A few years ago, when apples were plentiful and chaff dear, he knew this had been done. A little chaff mixed with plenty of apples had kept his horses in good working condition. They had travelled over 200 miles in a week on this diet. There should be more protection for tenants occupying infested gardens.

Mr. SWANN had fed his horses on chaff and apples, and they looked better than when fed on oats. In the Angaston district the growers had practically adopted the suggestion of the new Bill—as outlined by Mr. Quinn—with a view to destroying infested fruits and compensating the owners. Let the growers co-operate in this as in every other work. It had been found as in other instances the moth had been brought to Angaston in the empty cases from the factories which were supplied from infested districts. A number of their growers refused to bring back empty cases. He believed the large trees should be reduced in height. Owing to the good name our apples had secured Tasmanian exporters had bought apples in Angaston and sent them to England to get the early markets. He suspected they were sent as Tasmanian apples. Planting had been done extensively, owing to the opening of the export trade with England.

Mr. MONKS said if the growers united in connection with the work in the orchards, and the regulations were carried out systematically, there would not be so much fuss and bother about the sale of the infested fruits, because there would not be such a quantity of them. From the grower's standpoint we were relying too much upon bandages. We must pick off more infested fruits, and attend more closely to the fallen fruits. In the season just passed a very large proportion of the caterpillars never entered the bandages at all. They went into the soil, and came up during the winter into the bandages. If we want to grapple with the thing in earnest we must reduce the size of our overgrown trees, and we must catch the insects in the fruit itself, otherwise too many will escape us. He believed we could produce good vinegar and cider. Speaking as a grower, he hoped infested fruit would never be allowed to enter the open markets for general sale. In cold countries, with one brood only, no progress was made by the pest; but here we had three broods. He believed the moth would become so numerous as to infect all the fruits at the early part of the season, and as such fruits do not develop to be of any value whatever, the need for increased attention was obvious.

Mr. TOWNSEND said they took very little notice of the moth in England. In Covent Garden the few mothy fruits that arrived from South Australia caused a great deal of comment. He paid 6d. per lb. in Wales for Tasmanian apples (sold as South Australian) but they lacked flavor.

Mr. JAMIESON, M.P., was somewhat puzzled as to what grounds to take in this matter of infested fruits. He fully recognised when these things came before Parliament they should know something of the matter. He believed if a vote on such a subject could be taken among the fruitgrowers to ascertain what the majority wanted, probably some general conclusion might be arrived at.

Mr. LEE said the question had been discussed many times previously by the Gumeracha Branch. He believed the law should be more stringent. The Branch had previously supported the Government in upholding the law. The pest was increasing, and the inspection could not be done efficiently by the present staff over such a large area. He believed if local inspectors were appointed, subject to the Central Department, good work might be done. The small grower was often at the bottom of the mischief in districts such as

Gumeracha. Such persons did not make a living out of the apples, consequently they did not suffer from their own neglect. He had known 165 caterpillars to be found in one bandage in a small garden. The adjoining orchards suffered from such neglect. He did not believe in selling infested fruits in the open markets, but it should be permissible to use it in manufactures, as had been indicated by other speakers.

Capt. RANDALL felt sure the fruit-growing industry was going to be a big thing in South Australia. He believed in twenty years the returns may even overtake the wheat export. Would it not be wise for the large growers to tax themselves, and devote the funds to pay small growers for destroying their fruit or their trees? (Mr. Swann—"That has been done in the Angaston district, even without the owner accepting compensation.")

Mr. VICARS remarked upon keeping the gardens clean, and instanced several cases where cleanly growers suffered very badly from the pest. It appeared as if cleanly cultivation did not assist in reducing the pest.

Mr. QUINN believed very fine tilth was not as favorable to the insects hiding in the soil as tillage which left the soil in a lumpy, cloddy condition. Some gardeners raked the soil beneath the trees and reduced it to powder. This also saved the wind-blown fruits from unnecessary bruising, and was conducive to the retention of moisture.

Dr. STEVENS suggested employing fowls to scratch around the stems for hidden larvæ.

Mr. JAMIESON asked if a hay or pea crop would afford harbor for the caterpillars?

Mr. QUINN thought the insects would crawl through the hay crop looking for shelter, but possibly some of them might be carted away in the hay, and thus be distributed. He believed most of such crops were mown and removed before many of the caterpillars were leaving the young fruits and actively crawling about looking for shelter. Of course the hay or pea crop was not there to harbor them from the previous season. He deprecated the practice of growing hay crops on the grounds of robbing the soil of moisture.

Social Evening.

In the evening there was a good attendance of ladies and gentlemen. After several musical items had been rendered, Mr. A. Molineux, General Secretary Agricultural Bureau, read the following:

An Old Idea in a New Form.

With a view to further popularising the work of the Agricultural Bureau, and making its work even more practically beneficial to each district within the area influenced by each of its Branches, the question should be seriously discussed by every Branch as to whether it is possible to arrange for a periodical re-union, embracing the attendance not only of the members of the Branch and their wives and families, but also of their friends. Perhaps a quarterly meeting of this sort would be too great an undertaking for most of the Branches, and a few might consider half-yearly gatherings too much of a good thing—but, is it not possible and highly desirable to have at least an annual assemblage of members and their families and friends? Suppose such a course were approved of, the question would then arise as to what would be the most rational and profitable method of entertaining and instructing the visitors? The idea should be to combine pleasure with profit. Dry discussions on fertilisers, sheep, pickling wheat, and the usual routine business of the Bureau might not be so attractive to the womenfolk and the younger members—although of much importance to the practical farmer. Indeed, the members of the Branch might reasonably take a back seat for the day, and give their "better halves" and the young people a chance to show what they are made of, and I venture the opinion that they could, in some cases at least, show the menfolk how to conduct a lively and instructive meeting. There are a thousand and one useful subjects that are worthy of consideration by both sexes—(many of them, perhaps, better understood by the womenfolk)—not exactly agronomical, but essentially closely connected with the comfortable and profitable occupation of the land. For instance, the question

of "What is the best education for a farmer's boy?" is a vital one for both his father and his mother; but when a number of fathers and mothers meet in consultation on the subject, there would surely be some thoughts expressed that would not probably present themselves to every mind. Again, "Which is the best way to train a farmer's daughter?" would probably bring forth a great variety of opinions, but we might certainly rely upon the practical and utilitarian ideas being in the ascendant at such a meeting as I am trying to shadow in this present paper. "How to decorate the home" would give rise to extreme views, perhaps, with regard to hygiene in connection with the collection of microbes and bacilli on the frippery used to decorate the walls and everything about the rooms, whilst others would naturally call attention to the extra labor involved in dusting the innumerable articles, and both parties would combine in condemning what to the others is 'a thing of beauty and a joy for'—as long as it lasts. "Should the young people be admitted to the family councils?" would find favor with many whose homes are well regulated, and they would admit most probably that "wisdom is justified in her children," and that even young heads may suggest valuable ideas. But there may be a few who require to be convinced that the youngsters are sometimes able to work out little problems to a satisfactory solution. In connection with that subject, perhaps, might come the question of "Pleasurable evenings for young and old," and, when considering that, some of the youngsters might like to have one or two of their own friends to be invited to the house, or could suggest something that would aid the project. Another subject closely connected with the preceding would be "The table, and what to provide for it." With most people the question of eating and drinking is of some importance. If the table is well kept, the viands well cooked, and the decoration of the board is tasteful, there is certainly more hope of everyone being satisfied with his home on the farm than where there is a scanty supply, in limited variety, ill-cooked and served on a bare table without any attempt at ornamentation. Perhaps some of the fairer sex might talk to the hard, practical, utilitarian, stern-visaged men of the plough or the pruning-hook about the decoration of the exterior of the dwelling, and by argument and other fair means bring them to a perception of the necessity of planting shelter belts of trees about the house, and to the establishment of a garden in which vegetables, fruits, and—above all—flowers shall be grown. Probably there never has been, and never will be, a home where flowers are grown regularly, and where grumbling, discontent, and other disagreeables make a regular abode. It is the flaw in human nature that the temper is not always serene, but the smiling flowers will inevitably and rapidly restore equanimity. There is one more matter I will refer to. At these friendly meetings the ladies could exhibit samples of their handiwork in every section of home industries, exchange recipes and ideas, and also manage to let all present partake of the good things they may have manufactured in the regions of the kitchen.

Mr. W. HANNAFORD thought the writer had hit the right nail on the head. He favored the social element in the Bureau, providing it was not carried to excess.

Mr. JAMIESON said he would like to see many of the ideas carried out. In Bureaus there were no distinctive lines such as existed in social and religious societies. The education of the farmers' sons and daughters was of very great importance.

Mr. THORN stated the Angaston Branch had discussed this matter, and many of the suggestions thrown out by Mr. Molineux would be of value to them. He thought the presence of the ladies occasionally would be a stimulus to the members. For instance, they might take up the culture of flowers and other beautiful things, which would lighten the burden of life.

Mr. SWAN said while Chairman of the Angaston Branch he had introduced the social element with satisfactory results.

Mr. VICARS considered there should be some inducement for the young people to attend the meetings, and suggested they be invited to sample new fruits, melons, &c.

Tillage of the Orchard.

Mr. G. QUINN, Horticultural Instructor, &c., to the Agricultural Department, then read the following paper:—

Tillage of the soil has been defined as "stirring the ground for the direct purpose of making plants thrive." The benefits derived from tillage may be arranged under four headings, viz.:—

1. It improves the physical condition of the land.
2. It saves moisture.
3. It assists chemical and bacterial activity.
4. It protects cultivated plants.

Before analysing these principles any further we will do well to consider what are the essential requirements in the profitable development of plants.

In the distribution of our trees over the orchard area at the time of planting, and the proper spacing of the branches and twigs by pruning, we make all necessary provision for the extension of the portion above ground. Due regard having been paid to these matters, the functions of the top may proceed in a satisfactory manner if the requirements of the roots are met. In the first place the soil must contain all of those constituents to build up the plant tissues which are not furnished by the atmosphere. Secondly, there must be a sufficiency of moisture in the soil to not only dissolve those mineral requirements, but to keep the plant in a stiff robust condition. We must not forget that all that the plant derives from the soil must be taken up in solution, and as it has been estimated that not less than 300lbs. of moisture are needed to provide the necessary elements to build up 1lb. of dry solid plant matter, we can see what an immense quantity is required and is transpired through the foliage into the atmosphere. To enable the plant to grow freely the soil must not only possess plant foods and moisture, but it must be of such a texture as to admit oxygen to the roots, and to permit the roots to pass freely through its bulk in search of food. The tender growing portions of the roots consist of delicate cells; some of these are distended into little tubular organs called root-hairs. These tender microscopic organs absorb most of the plant food in the moisture. We can, therefore, see the reason why the soil texture should be free and wholesome if these tender organs are to ramify its bulk in search of plant foods. We may, therefore, sum up the position thus: If the plant food is present in the soil, but owing to lack of moisture or want of exposure to the effects of weathering, or to the absence of bacterial agencies this food is not made available to the root-hairs, the progress of the plant is restricted or suspended absolutely.

Let us now return to our first principle, dealing with the physical texture of the soil. Texture refers to the condition or state, and is passive. It is upon this condition, however, that the operation of other physical, chemical, and bacterial forces chiefly depends. A finely divided, mellow, friable soil is more productive than a hard lumpy one, even though they each contain the same proportions of chemical constituents. This is because it holds more moisture, holds more air, promotes nitrification, and hastens the decomposition of the mineral elements. It maintains a more equable temperature and affords a better root hold to the plant, besides offering a wider feeding area to its roots. This latter arises from the fact that the particles are smaller, and as the root-hairs run over and cling to the surfaces of the particles, the feeding area extends in proportion to the sub-division: for instance, a cube cut into two pieces exhibits one-third more surface to view. It will thus be seen that breaking the soil into fine particles releases more plant food, and in other words is equivalent to fertilising it for the time being.

Texture is obtained by two processes, viz., by breaking the particles by tillage, or by adding extraneous matter. These are produced by mechanical forces, or by the application of extraneous substances which act chemically upon the particles; the former illustrated in tillage, the latter by the application of lime or manure rich in humus. The improvement in the texture of the soil begins therefore in the preparation of the land for planting our trees. To achieve the objects outlined above, we must open our compacted soils deeply, and compact our leachy, over-porous lands. In the application of the work the last named are seldom met; the former are common. In considering the depth we shall prepare our lands, let us view the tilled layer as a dish filled with soil. One inch of rain caught in 1in. of soil will saturate it and exclude the air, as it does not move until evaporated from the surface, and this means reduced temperature while it proceeds. The unbroken surface beneath the tilled layer in a non-porous soil represents the bottom of the dish. If we break our orchard lands only 6in. deep when preparing to plant, we must expect that tilled layer to be sodden and running over, and readily washed away in the rainy season. On our average lands the water will run off the saturated surface much more readily than it will sink into the subsoil. We can therefore see if moisture is to penetrate and air follow, and the texture of the soil improve, we must apply mechanical forces at the outset on such lands.

Coming to our second principle, "It saves moisture," this need is still more strongly accentuated. Before we can save moisture we must secure it. If the 12in. or 16in. of rain which fall during the winter season could be passed through say 18in. or 20in. of well-prepared ground, the immense area of space surrounding the countless myriads of soil particles would hold a large portion of it in capillary suspension. If we provide means for the escape of free moisture when it passes through the soil we shall then retain that condition which allows the soil to hold its fullest capacity of wholesome moisture.

If we take a flowerpot and fill it with soil and saturate that soil with water, the vent or drainage hole in its bottom will permit all free moisture to escape. When the water ceases to drip from this hole there is much moisture still retained in the soil in the pot. This is capillary moisture. It is not under the influence of gravity as the free water is. If it were it would continue to drop from the bottom of the pot until the soil within became perfectly dry. The moisture which remains in the pot soil will pass off through the surface of the soil or through the sides of the pot if it be made of porous material. If we cover the top of the moist soil

with a piece of closely-woven blanket, or a layer of fine dust, the escape of moisture is lessened. We have referred to the spaces between the soil particles being filled with moisture. If the particles are very fine, and moisture is attracted in a certain direction—usually to the thinnest films, the connecting spaces or capillaries replace the lost moisture, drawing it from where it is most plentiful, which is usually lower down. As the particles of soil increase in size, such a motion decreases in rapidity until, in the case of large impervious lumps, the action practically ceases. If we bring our soils to a fine texture we increase the capillary action in them. This action is very desirable while it occurs in the stratum occupied by the roots. It is a loss and an evil when it continues to the surface of the orchard, because it draws out and rapidly dissipates into the air the moisture which the soil secured in the rainy season. It also tends to draw the roots up to the surface.

We desire that as much as possible of this moisture should pass through our plants, and as little as possible to be drawn out in any other manner. The most practical and effective method to obtain this result is to establish and maintain a layer of finely-divided dust-like earth over the surface of the orchard. The thicker the layer of blanket covering the moist soil in the flowerpot the longer will the moisture take to pass through it. The drier, thicker, and looser the "dust blanket" used over the orchard the longer will the moisture be retained. The reason it acts thus is that the capillary spaces in the moist under-soil can form no connection with the air. This dust blanket is made, renewed, or repaired by tillage whenever the need arises. We can thus sum up by saying that tillage saves moisture by increasing the water-holding capacity of the soil and by checking surface evaporation.

Under the third principle, which states that it assists chemical and bacterial activity. We know that by admitting air to the soil the decomposition of various substances is hastened. If any metal instrument is left exposed to the air the oxygen in the air begins to unite with the metal and forms oxides, or, as we put it, the implements rust. The fine particles which rub off on to the hands are undergoing disintegration. Thus when the air is admitted and moisture is present decay is hastened and changes wrought in a chemical sense.

Water is the greatest, though not the most rapid, solvent known, consequently the longer the moisture is retained the longer will chemical action in the shape of turning solids into a soluble form be prolonged and augmented during each season. The mechanical rubbing together of the moist particles caused by tillage operations is equivalent in a degree to the stirring which induces the sugar to dissolve in a cup of tea. Turning the surface to the rain, oxygen, and sun heat one year, and turning it down into the dark moist layers another, causes the cultivator to—unconsciously perhaps, but nevertheless most absolutely—carry on the greatest series of chemical reactions that the world knows. Although yet veiled in considerable obscurity, we know sufficient to affirm that all of the changes in the soil so desirable to the proper maintenance of trees and plants generally do not arise from the chemical sources alone. The manufacture and fixation of nitrogen in an available form to the plants is carried on by bacterial agencies. The activity of these organisms varies with the climatic and soil conditions. As our tillage operations tend to maintain a supply of moisture and an equable temperature in the soil, as well as ensure the incorporation and decay of organic matter, we, by its application, maintain over a longer period the conditions most congenial to their activity. We are all familiar with the odor of ammonia which arises from the heap of fresh manure when it decomposes rapidly. We also note the disappearance of that odor when, owing to being "turned" frequently, the heap decays very slowly. In this we have a prominent example of the action which these minute organisms carry on in the decaying organic matter in the soil. Instead of the nitrogen passing off in the compound known as "ammonia," it is seized and by obscure processes changed into a form which is readily soluble and easily absorbed by the tender root-hairs of the plant. We can sum up this by saying that tillage assists chemical and bacterial activity because it aids in setting free plant foods, and, by hastening the decay of organic matter, it promotes nitrification.

Our fourth proposition, that tillage protects cultivated plants, is a truism requiring but little elaboration. If there be a limited quantity of plant food and moisture in a certain area of land, we can safely say that the less number of plants drawing upon those constituents the better chance each one will have of thriving. We also know that the area of the surface of an orchard can only receive a certain volume of rays of sunshine, consequently a limited number of trees alone can spread out their branches to receive a sufficiency of light upon each. For these reasons we restrict the growth to the trees alone, and we set out only such a number of these as experience has demonstrated can be supplied with the above essential requirements. By thus destroying all undesirable plants in the form of weeds and suckers we relieve the competitive stress. The weeds and the suckers are often hardier and more greedy than the desirable plants.

Tillage will often assist to protect our trees from the ravages of some insects, more especially those which hibernate in the soil during the winter, or descend therein to undergo transformations at any period. By disturbing them tillage may harass and retard their vital processes, or expose them to the attacks of birds or other enemies, or even kill them outright by mechanical force or by exposure to the elements.

In this State, in the tillage of the orchards, undue importance is often attached to the protection of the trees by the killing of weeds. I have often asked many fruit and vine growers the question, "Why do you cultivate your plantation?" and the reply generally given has been, "To kill weeds," and the practices followed repeated it a thousand times louder. Let us repeat why we should till our soils.

1. To improve the physical texture of the soil.
2. To save (and I should say secure) moisture.
3. To liberate plant food.
4. To protect the plants from undesirable competitors.

In the climate of South Australia I am firmly convinced that the whole of these will be secured to us if we succeed in accomplishing the object set out in the second proposition, viz., to secure and save the moisture. In these days when the conservation of water is much talked of to assist the cultivators of orchards and fields, would it not be well for us to more carefully study the subject of the conservation of soil moisture. Very few orchardists can afford to make huge dams, or pay for water from those constructed by the State, but the conservation of moisture in the soil reservoir by means of tillage is in every district which is blessed with a fair annual rainfall, within the powers of nearly every fruitgrower. I would sum up its practical application in a few sentences.

1. Prepare the soil to increase its water-holding capacity before planting. In each year before the bulk of the rain falls prepare it to receive the moisture. In each year while abundance of moisture is present bury the weeds so that they may immediately decay. Each springtime before the all-important moment has passed which leaves the orchard a mass of piled up crusts, break down the soil into a fine tilth. Maintain that fine, dry, dusty tilth by tillage, renewing it whenever its particles tend to cohere.

Mr. W. HANNAFORD thought the paper was too technical for most of them to criticise. He believed in deep tillage before planting, but not afterwards. If after ploughings were deep the trees were root-pruned too much. Loose tillage caused the roots to grow up into the tilled layer. His best fruits came from trees growing on the top of the hill, where the cultivation was slight. In this district they believed in tillage to protect the trees from fires. He did not think it was necessary to cultivate in all localities. Until late years the trees obtained sufficient moisture without tillage.

Mr. JAMIESON asked if the writer advocated the same kind of tillage for every district? Would lumpy soil let the water away better than finely-pulverised soils? Would the writer dig large holes before planting the trees? Would he prefer growing fruit in a district where, with good cultivation, the natural rainfall supplied all needs, or where irrigation was practised?

Mr. QUINN, in reply, said the same principles underlaid cultivation in every district. Their adaptation, however, to the peculiarities of soil must vary to a certain extent to meet local requirements. In very dry districts the dust mulch must be maintained much more persistently than is needed in a wet locality. Even in the wetter districts of South Australia it was necessary to maintain a soil mulch. Lumpy soil would do all right in the winter, as it permitted the water to sink into and through the soil. If they had under-drainage, either natural or artificial, they need not fear. In the summer lumpy soils let the water away by evaporation much more quickly than was desirable, consequently it should be worked down fine while yet moist enough in early summer. He would not dig holes if the subsoil were retentive, and holes were evil expedients at the best of times or in any soil, no matter how well drained. If holes are dug into a retentive subsoil the plant's roots do not strike out freely into the compacted stiff soil around, but work in the soil in the hole, and soon reproduce the condition of a pot-bound plant which cannot be repotted. He would certainly prefer growing fruit where the heavens supplied the water direct in preference to the intervention of the costly hydraulic engineer. Of course two different sections of fruit-growing were undertaken under the rainfall and irrigation processes in South Australia, and it was difficult to compare them. He thought Mr. Hannaford had not grasped the true idea of the "dry dust blanket" or its effect. The roots of the trees came up to the base of the mulch layer, but not into it, if it is

maintained as a dry dust layer. If allowed to crust over after showers, the result he named would doubtless be realised. If the mulch of manure or straw or litter be placed on the surface, the roots will come up to the surface of the cultivated layer which is beneath the litter. Ploughing under such methods would result, as Mr. Hannaford asserted, in much injury to the roots. If the soil had been deeply and carefully prepared prior to planting, deep ploughing and cultivation would force them into a lower layer and keep them there. This was an advantage in a dry climate, because of the more permanently moist nature of the sub-layers of soil.

Mr. MARTIN asked how was capillarity increased when the surface of the soil became crusted after showers of rain?

Mr. QUINN explained that the rain soaked into the dry dust-like layer, and thus formed a connection with the capillary moisture beneath. The connection thus formed drew the moisture up to the surface and it became dissipated into the air. The remedy was, of course, to renew the dry dust-like layer by tillage as soon as the surface lost its stickiness or excess of moisture, and by this means break the capillary connection between the air and the stored moisture in the sub-soil.

Mr. R. MARSHALL was satisfied the methods advocated were correct for the northern districts. He had experience in planting trees in holes, and the results were precisely as described. In the district in which he had lived they only had thirteen inches of rain during some seasons, and yet, with close attention to the methods described by the writer, most excellent crops of fruits, suitable to the district were produced. He believed the excellent principles laid down in the paper were applicable to the wheat field as well as to the orchard and vineyard.

The remainder of the evening was devoted to social and musical items provided by local ladies and gentlemen.

SECOND DAY.

Prior to meeting at 10.30 a.m. on Friday, November 8th, the delegates, at the kindly invitation of the owner, visited the homestead of Captain Randell, to see the dairy herd, silos, a new pea-gathering rake, and the fine plantation of exotic trees generally. The dairy herd is extensive, and carefully selected. The silos are constructed in a huge barn, and were favorably commented upon for economical arrangement. The pea rake, which comes from the Ballarat district of Victoria, favorably impressed the visitors, combining efficiency with simplicity and cheapness. It was explained that nine acres of peas per day could be pulled and collected with the implement. The huge specimens of poplars, ailantus, oaks, elms, willows, and many other trees, were a source of delight to the delegates from drier and less favored parts.

From "The Oaks" the party visited the District Butter, Dairy, and Cheese Factory, where they were courteously shown over the works by Captain Randell and the manager. The factory is well appointed and equipped with a refrigerating room, and all the appliances for the production of a first-class article.

Suggestions to Farmers.

The delegates returned to the Institute, where the Chairman (Mr. D. Hanna) read the following paper:—

Co-operation among the farmers seems most difficult to accomplish, yet the benefits to be derived are so numerous that there should be no hesitation on their part to combine for the purpose of securing better prices for their products, and to enable them to purchase agricultural machinery, dairying appliances, manures, &c., at the lowest possible cost. Agricultural machinery costs too much here compared with the price paid for binders, seed-drills, &c., in

the English or American markets. By the time they are landed at Port Adelaide their value has increased from 50 per cent. to 75 per cent. What is there to prevent farmers importing their own machinery, dairy appliances, &c., and saving the money which is at present received by the various agents or middlemen? In the purchase of manures a saving could be effected if a number of farmers in each district simply agreed upon the quantity of the different kinds of manures required by each. Quotations could then be obtained direct from the local manufacturers or agents, and an order given for the lot in one line. Large quantities of manures are used in this district, and the greater portion of it is ordered through country agents, who no doubt receive a commission, which the farmers might have if they would only combine a little. They should either import their own manures, order them in Adelaide, or do the business in conjunction with the Farmers' Union. The latter course, in my opinion, is the proper one. I believe the time is not far distant when it will be even more desirable than at present for farmers to combine to protect themselves against organisations formed by nearly every other class of society. Grain of various kinds for seed could be purchased to advantage locally or from the other States, and in this way a change of seed obtained which would no doubt be beneficial in many ways. Fodder crops will no doubt be grown more extensively in the near future, and the various kinds of seed, such as lucern, rape, mustard, turnips, maize, and several others, could be purchased in large quantities either in this or the other States for less money than is paid to local seedsmen. It would certainly pay to grow some of these seeds for less than the producer pays for them. The greatest drawback would be the want of proper machinery for cleaning the seed, and finding a market for any very large quantity of it. Farmers might easily combine to grind their own wattle bark, cut their own hay into chaff, and crush grain, &c.; such a business could be established without very much capital, and expensive buildings or machinery would not be necessary and very little skilled labor required. The commissions received by produce salesmen for selling our produce are much too high, and if factories and dairymen would agree to open a depôt of their own and employ their own salesmen to dispose of all their produce I feel sure the commissions would be much less. The Farmers' Union, I think, will at no very distant period be in a position to dispose of all our products at the same or a less commission than now paid to produce salesmen of Adelaide. Large numbers of cattle, sheep, lambs, pigs, and calves are sold in Adelaide market weekly by a number of salesmen, each selling alternately for a limited time. One salesman could do the selling in the same or even less time and at a less commission than is now charged. Country factories and creameries should be loyally supported by dairymen, and the milk and cream delivered to them in the best possible condition. If this is done good butter and cheese can then be made, and the highest price paid to the contributor. It is most unfair and somewhat mean for dairymen to make a convenience of factories when they have no time, or the weather is too hot for them to manufacture their own butter at home; such persons would be fairly treated if they were requested to send all their cream or none at all except at reduced prices. The factories were instrumental in opening up the export trade, which relieved the local market of surplus butter and kept the prices here more uniform. This directly benefits all dairymen. This should be sufficient inducement to them to deliver the whole of their milk and cream to the factories, and abandon the practice of making their own butter, which is a retrograde step, and one that may close our country factories and help to build up a monopoly of the dairying industry in the city. Our export trade would also suffer through the manufacture of an inferior and uneven quality of butter being placed on the market.

Mr. MOLINEUX emphasised the necessity for the cream producers supporting their own factory through thick and thin. The state of things before the local factory came into existence was very damaging to the dairying industry. The maintenance of a high quality of butter was conducive to increased consumption. When a factory was started and maintained at considerable expense, the dairymen should keep it going instead of sending their cream to distant places when the price rose temporarily. The cost of running the factory was nearly as great on 200galls. a day as it would be on 2,000galls., and the factory could give higher prices for milk and still realise greater profits when running at full capacity than when running with 100galls. to 200galls. a day. A shareholder in the factory who also ran his own separator and sent the cream or butter away from his local factory, would have to make big profits to pay him for his separator and the labor of working it. But if he wanted the skim milk, and sent his cream to the local factory, he would be acting wisely.

Mr. THORN did not agree with farmers grinding their own wattle-bark or selling their own stock instead of sending them to the auctioneer. He deprecated the action of dairymen who did not support their local factory, but sent the cream to a distant factory in the city. Sending cream long distances

would depreciate the quality of the butter throughout the State. In Angaston a factory was established, the plant being supplied by a city firm. When the factory was in working order the same firm sold a lot of private separators in the district, and induced the dairymen to send their cream to the firm's city factory, the result being that the local factory was closed.

Capt. RANDALL agreed generally with the adoption of co-operation among the farmers. He saw many points on which they could unite with gain. In the carriage of cream or milk to the factory one vehicle would carry all that several farmers, living closely together, produced. Then why not go in turns instead of each one wasting time each day? (Mr. MOLINEUX: Would it pay the factory to provide a collecting vehicle?) He did not think so, though the matter might be worthy of consideration in some localities. He believed they would yet see a motor car running around the district doing the work. Formerly the butter was made from cream separated at the factory. The reason why private separators were purchased was because they wanted the skim milk for the pigs and calves. They were also able to run a lesser number of times per week to the factory and thus save the time and wear and tear alluded to. In consequence of holding, the cream deteriorated. He did not think the private separators would be so harmful if the cream were delivered at the factory say three times a week or more. It might be thought they would be willing to accept a lesser price for this inferior cream, but it was not so, and so dissension crept in. At the local factory they had often to make a second quality of butter owing to the cream having been kept too long before being delivered to the factory. The complaint of the want of loyalty to the factories was justified, as each winter it was hard work to pay expenses owing to the limited supply of cream. The farmers having only a small quantity of butter to make preferred making it themselves, and sent it into Adelaide, thus saving the 1d. per pound charged by the factory for manufacturing. Every customer of a local factory should be made to sign an agreement to send the whole of the milk to the factory all the year round or not at all. The idea of having our own agent in cities may come in time, but at present the volume of trade scarcely warranted the expense. He believed it would pay to combine for the purpose of procuring machinery.

Mr. MOLINEUX referred to certain lines of trade in which goods had to be stocked on the off chance of an occasional sale being effected. In such cases there was a need for the merchant and middleman. While co-operation held good in many items of manufacturing, local products, &c., it did not necessarily follow in general storekeeping.

Mr. JAMIESON stated in connection with certain agricultural implements not locally manufactured there were sole agencies established. In such a matter competition did not come in to safeguard the interests of the producers by keeping prices down. In some kinds duplicate parts are not largely stocked, because each year or two sees some slight improvement in the machine, and it is to the interest of the importer to induce the farmer to buy a new one if possible. Farmers should combine, select a good kind of implement, import a number, and the necessary breakable parts for repairing them. This would save time and money in the long run. The Farmers' Union was selling a machine for £38 10s. which was sold by the other combinations for £52. The private combines raised the prices when there was a chance of a heavy harvest.

Mr. CORNISH referred to and corroborated what had been said about the difficulty of obtaining duplicate parts for repairing. He had to send to Victoria for them.

Mr. MONKS thought co-operation at first at any rate should be confined to well-defined items, and not generalities. He failed to see why the producer should be kept under the thumb of the middleman in all things. If producers

all the world over only combined they were in a position to starve the rest of community and dictate their own terms. Notwithstanding these undeniable facts, at the present time we practically have no voice in the disposal of our own produce. In bulk items the producer could combine and supply their own needs at a saving.

Mr. LEE saw many points of local interest in the paper. Often at this time of the year the city agents send us a circular advising us to bulk our butter, because it brings a farthing per lb. more. We are prepared to take this, but at the same time we send in the bulk butter. By the time it reaches the city prints are bringing more, in consequence of the reduced supply. Another circular, on the lines that a certain brand of butter realised so much per lb., and advising us to send on our cream, to get a more satisfactory price. It is quite true that agents will supply a factory with a high-priced plant, and then sell the customers of the factory private separators. If the factories are not well supported they must close. This will result in a big monopoly being built up. Such a monopoly will dictate to the dairymen, and the industry will be in a worse state than before the factory system was inaugurated. In this district some persons had laid out a goodly sum in a private plant, and he wanted to know how long they would have to work before they obtained a profit on this capital outlay? In suitable cool weather private persons could make good butter, but when the hot weather set in they liked to send the cream to the factory, but they forgot the fact that they were hastening the closing up of the factories by their methods of working. They forget they are the owners of the factory, and should support the management, and not treat them as if they were enemies. Respecting the importation of manures, he did not think there was much to be gained. Plenty of competition between exporters kept the prices reasonable at present. If the farmers combined and treated with the merchant, say for 50 tons, they would secure it cheaper than each one buying a ton or two. Oil cake and other items could be dealt with similarly. Producers like individual effort, because at times they secure a slightly higher price for their produce, even though in the long run they may lose.

Mr. H. NOSWORTHY considered that middlemen were necessary in many items of trade. Theoretically many things looked well, but in practice they did not pan out profitably. If a large factory could be established locally, and the cream made up as cheaply as in large city factories, then a better profit could be made. There was a danger of co-operations becoming overwieldy and breaking down with their own weight. He believed if the whole of the country butter factories could unite and have their salesmen and agents in the city it would prove profitable, and co-operation should be a success if limited to a few productions.

Mr. MARSHALL had experience in sending separated cream to a factory in the city, and found things did not turn out all that could be desired. Very frequently more butter was obtained when the cream was churned at home. Such things were unsatisfactory. He believed co-operation would overcome the machine problem referred to by delegates, and corroborated the statement respecting the small profit made in importing fertilisers.

Horse-breeding.

The GENERAL SECRETARY read a paper forwarded by Mr. Schutze, of Mannum Branch.

As horses are more valuable now than for some time past, more attention should be paid to the breeding of them, as it is an important matter to the farmer especially, as well as to the State generally. The breed of horses throughout the State has deteriorated considerably. Many farmers seem to be unaware of the fact that it costs but little more to rear a good horse than to raise a bad one, whereas the good horse will do more work and fetch a much better price than a mongrel. One difficulty breeders have is that when the season comes round they do not know what stallions will travel the district, and inferior horses that are started early are given

most of the mares, so that it will not pay to travel a good one. To remedy this I would advocate holding a meeting of owners of breeding stock annually in farming or breeding centres at a convenient time, when owners of stallions and owners of breeding mares could come to definite arrangements. This is done in Victoria with very satisfactory results, and I do not see any reason why it should not be adopted here and answer in the same results to breeders. I have had an opportunity to see a show at Horsham which has taught me a very instructive lesson in this matter. The next question is, "What kind of horses shall we breed, and which will promise the best return?" In my opinion heavy draught horses of size, stamp, and temper of the Clydesdale would answer best for the purpose of heavy dray and trolly work in this State, as well as for sale to our neighbour State of Victoria, where a far greater number of this stamp is required, and a good price is paid for them here. For our own farm requirements I would breed a medium draught with heavy body, good muscles, flat bone, not too much but fine hair on its legs, and a short but wide head. This stamp would suit for farm and road work where more activity is required. These two kinds of horses can be bred without much selections from the mares which we have available as long as the stallion is a good one. There is another class of horses that will pay well to breed, which we may call remounts or carriage horses. In no class of horses have we more mongrels than in this particular one. Almost everybody seems to have a trap or buggy which is very often moved along by a beast or two not much better than a donkey in appearance. To breed good remounts and carriage horses great care should be exercised in picking the mares to breed from: they should be well shaped and not too light. The stallion should be a purebred blood, either English or Arab. I would prefer the latter on account of its hardihood and good temper. With such horses we should be able to lay the foundation of a breeding stock from which horses could be bred to compete on the world's market. The last and most difficult question will be, "How can we get and maintain the required stallions and get our mares served properly at reasonable fees?" I would advocate co-operation, but as this is a different question I will not further deal with it.

Mr. CORNISH said if the writer were correct it was certainly a contradiction to say that the totalizer or racing would improve the breed of horses.

Mr. W. HANNAFORD thought the value of horses would depend upon the demand, and only the best would find a market in time. It would seem as if horse traction in the cities would be eventually done away with almost completely. Electric and other modes of traction were bound to come, and this would gradually reduce the demand for horses. If we breed we should breed first-class horses, whether they are ponies or draughts.

Mr. JAMIESON agreed that the decline in horse traction would render horse-breeding a precarious occupation. In Adelaide electric traction would be applied to the tramcars within a few years. This would throw about 1,300 horses on the markets. These consumed about £20,000 worth of fodder annually. He believed horses would be required in many occupations for many years to come. On farms the horse must always hold its place as a means of draught. To breed horses profitably we must have cheap land, and he thought the industry would suit the Northern Territory of South Australia. He advised farmers to breed their own horses, as horses bred in any locality had special advantages over outsiders.

Mr. MOLINEUX said when he was a boy, sixty years ago, the same cry of "the horse must go" was raised. This had not been realised yet, and he believed the horse would always be of value to mankind.

Improvement of Wheats.

Mr. R. MARSHALL then read a short paper as follows:—

Improvement of wheats has engaged the attention of a good many agriculturists and others for a good many years past to counteract deterioration and effect an improvement. Selection has frequently been resorted to in this connection, and Le Conteur, Sheriff, Webb, Hallett, and a good many others have directed their attention at various times in England and Scotland, Jones, Pringle, and Blount are names famous in America; Vilmorin, Rimpan, and others in France; besides a good many in Germany, whose names I forget, except Mr. Langfeldt, to whom I have sent and from whom I have received a large number of varieties of wheats from time to time. Out of these not one has been suitable to our climatic conditions, even those classed as spring wheats being too late. I believe it is generally recognised now that two methods exist whereby wheats can be improved. The first is by selection: the second is by

artificial cross fertilisation. All cereals are self-fertilising—that is, the male and female elements are contained within the same glumes—that in-and-in breeding goes on and on for all time. This is now regarded by professional men and experts as the invariable rule, or so little variable as to be accepted as accurate enough for a constant working proposition. The continual in-and-in breeding in time leads to deterioration, for the want of change in the sexual elements; thus we frequently hear farmers say they want a change of seed, their wheat is played out, and consider a change would be advisable from a distant part, where the soil and climate differs from their own. While admitting a change may be advantageous at times, providing the varieties acquired are suitable to the conditions, I believe better results can be obtained by selection, according to a well devised rule, for keeping up the character of the wheats than can be generally got by change. There is a large number of varieties of wheat, and the variations are considerable frequently in the same variety. It is because of this variation that the opportunity is offered for good work by selection. I believe nearly every quality can be gained to a greater or lesser extent, excepting improved milling quality. This quality (flour strength) belongs exclusively to the family of wheats known as the Fife wheats generally grown in America, Russia, and Hungary. Major Hallet, in England, obtained very surprising results by a peculiar system of his own in a very short time—four years. His plan was to select the best ear from the best plant, and one grain from each ear, which he found excelled in vitality to all others. It is on such-like principles that pedigree wheats are obtained, and their characteristics maintained, by the continued selection of the best for any given quality or qualities desired. As soon as care in selection and good cultivation is neglected will the good qualities begin to disappear, or be stable only in a very moderate degree, especially if won too quickly. I prefer the second method, by crossbreeding between selected varieties of different types, and selecting from the varying progeny which results from such crosses those plants possessing in the highest degree the qualities desired, and fixing types from them. When two varieties of different types are crossed artificially, although the plants from the seeds resemble one another closely, the plants from those seeds generally differ very widely when sown again, inasmuch as some plants may be early, some late, and some midway in ripening between the parents, while others will be tall and others short, differing in almost every particular; so much so that Mr. Farrar, the wheat expert of New South Wales, calls it the variable generation; and it is here, he tells us, he is always on the alert to get any quality he values—from this variable generation—to fix permanently in the offspring that which has been transmitted by its parents. Garton Brothers, of Newton Lea, Willows, Sussex, England, who have probably done more cross-fertilising work than anyone else, are decidedly of opinion that reliable selection is impossible at this stage. Their long experience has convinced them that the only safe course is to proceed as follows:—Suppose two crosses are attempted between two different varieties, and in each instance grain is obtained. These grains are separately sown, and each produces a plant with, say, 100 grains. Up to this point no sportive tendency can be detected. The two sets of 100 grains are kept separate, and the new plants springing from the respective plantings are examined for the purpose of ascertaining if they have sporting tendencies. Should either set show no sportive tendency they are discarded as not true crosses, and those that show the sportive tendency are continued and their seed sown during the variable period, which usually occupies about seven years, when the varying types are assumed to be fixed and the selections are made. From my own experience, which is much more limited than either of the gentlemen named, I feel pretty confident Mr. Farrar's method is the best to follow. From my own work I have varieties which have shown little or no tendency to sport, either in appearance or time of ripening. That they are true crosses I am sure; one in appearance resembles the mother parent, while its time of ripening is much earlier, and takes the season of the male parent; two other crosses resemble neither parent much, and take their time of ripening more in the season of the male parent (early); these cases are not usual, except in composite crosses, which do not take nearly so long a time to fix. That wheat can be bred for any given quality, or continuation of quality, I am quite certain, and those qualities fixed in them permanently, and lasting with a vigor of growth, for some years at any rate, that cannot be found in old varieties. By a judicious system of crossbreeding creating varieties suitable to all the conditions of our climate where wheats can be grown, and giving attention to their milling quality, I feel confident the intrinsic value of all our wheats can be raised fully 6d., or thereabouts, per bushel, which, on the basis of 12,000,000 bush. for export (which was about our surplus last year) would mean an extra purchasing power of the wheatgrowers of this State alone of £600,000 per annum; and this would be without any extra cost of machinery or labor, which is the estimated extra purchasing power derived by the use of fertilisers and the late improved methods of agriculture, which involve considerable outlay in seed drills and labor in the handling of fertilisers. For the work outlined to be a success it must be taken up by the Government in a systematic way, the wheats created being put to the milling test, any variety of high quality named and catalogued and full particulars published, and as soon as possible some system should be devised to place the high-class wheat in the hands of the farmers generally at moderate price, or small quantities distributed to every farmer gratis on application. Not until the cultivation

of those high-class wheats become general will their value be recognised. Well organised systems for carrying on the improvement of wheats and other domesticated plants prevail in the United States of America, Canada, England, Germany, France, New South Wales, and now being initiated into Victoria and Queensland. It has become necessary that the work should be taken up in this State to enable it to hold its own, which it will not do in a short time unless we follow the example of New South Wales, which has created varieties of wheats containing a maximum flour strength reaching to 68, and many varieties between that point and 60, which latter is about the strength represented by the best wheats of America.

Mr. MARSHALL went on to say that in stating that the value could be raised 6d. per bushel he was guided by the American wheats, which are strong flour wheats, and now command about 5d. per bushel more than ours in the English market. We have wheats made by crossing which produce stronger flour than the best American varieties. These American wheats weighed 56lbs. to 57lbs. per bushel, while in South Australia we produced wheats going 64lbs. to 65lbs. per bushel. If the flour strength of ours were equal it would raise them, he believed, fully 6d. per bushel in value and price. He had five best American wheats grown in New South Wales. These wheats when grown in New South Wales brought 6d. to 10d. per bushel more than our ordinary Australian varieties. The flour was worth £2 15s. per ton more than that made from our wheat. The best Manitoba flour is worth £4 10s. per ton more than ours, and 10,000 tons of it per annum are imported into New South Wales. The baker makes much more bread from the ton, because it absorbs more water. The gluten is more nitrogenous, and a higher percentage is contained in it. In South Australia wheat gluten had increased from eight to ten per cent. to twelve and even thirteen per cent. The Australian flour will absorb about 48qts. of water per 200lb. sack. The American flours absorb from 60qts. to 66qts. in the same quantity. Wheats made in New South Wales when grown and tested, absorbed 68qts. of water per 200lbs. sack of flour. He believed the same American wheats grown here would absorb 70qts. in 200lbs. of flour, or 22qts. more than our present varieties. In New South Wales the new wheats are tested thoroughly by a complete milling plant, and he hoped it would be done here also. It was the function of the State, as no private individual could carry on the work.

Next Conference.

It was decided to hold the next conference at Angaston in about twelve months' time.

Mr. MOLINEUX drew attention to several weeds brought in to the meeting. One is *Echium creticum*, and it is spreading over much of the hilly country in the locality. He recommended its destruction as far as practicable.

The usual votes of thanks closed the proceedings.

CAPACITY OF CISTERNS.

When calculating the capacity of cisterns (or tanks), 31½galls. are estimated to one barrel and 63galls. to one hogshead.

A Circular Cistern 1ft. in Depth.

Five feet diameter holds	122½galls.
Six " " "	176½ "
Seven " " "	240½ "
Eight " " "	314 "
Nine " " "	397½ "
Ten " " "	490½ "

A gallon of water weighs 10lbs., and measures 277·274 cub. in.; a cubic foot of water contains 6·23galls., and weighs 62·35lbs.; 1cwt. of water contains 11·2galls., and measures 1·8 cub. ft.; 1 ton of water contains 224galls., and measures 35·9 cub. ft.

CENTRAL AGRICULTURAL BUREAU.

MONDAY, NOVEMBER 18.

Present—Mr. F. Krichauff (Chairman), Sir Samuel Davenport, K.C.M.G., Hon. A. W. Sandford, M.L.C., Messrs. M. Holtze, H. Kelly, T. B. Robson, and A. Molineux (Secretary).

Fodder Plants and Grasses.

The CHAIRMAN stated that he had had an inquiry *re* *Trigonella foeniculum græcum*, the fodder plant which he referred to in his address at Congress. In Algeria from 18 tons to 32 tons of green forage per acre was obtained in two cuttings. Seeds were not obtainable in Australia: perhaps the Bureau might import some. [This is an error, as on inquiry I find that Messrs. E. & W. Hackett have seeds in stock.—GEN. SEC.]

Mr. HOLTZE said this was of very little value as a fodder plant; it could not compare with lucern, sulla or Malta clover (*Hedysarum coronarium*), or other plants in general cultivation. He had grown it on several occasions, but it was far from satisfactory. The Secretary also stated that it had been tried here, but as a fodder plant it was not a success.

Mr. HOLTZE stated that he had a considerable collection of imported grasses doing well at the Botanic Gardens, and some of them promised to be worth growing here.

Fruit Pests and Diseases.

Mr. ROBSON tabled loquats affected by some disease; the fruit on the west side of two trees was affected. The two trees were some distance apart. Doubt was expressed as to whether this was due to a fungus disease, or only a fungus attacking decay caused by hail or windstorms.

The CHAIRMAN referred to statement that the West Australian authorities had found cherry slug in South Australian cherries, and plum curculio in our plums.

The SECRETARY said neither insect existed in South Australia, and as far as he knew the true plum curculio was unknown in Australia. The cherry slug usually attacked the leaves of cherries, not the fruit, and it was most extraordinary if it could be so prevalent in South Australia without anyone here knowing of it, although very careful search had been made by our orchardists.

Green Manure Crops.

The Chairman, having received a request from Spain to be informed whether manuring with leguminous and other plants has been carried on with success in South Australia, requests to receive results.

New Members.

The following gentlemen were approved as members of the undermentioned Branches:—Davenport, Mr. Pybus; Caltowie, Mr. Jas. Noonan; Inkerman, Mr. F. C. Smart; Strathalbyn, Mr. G. Read; Riverton, Mr. E. Kelly; Amyton, Mr. Geo. Wheadon; Port Germein, Mr. Thos. Smith; Bowhill, Mr. H. Groth; Saddleworth, Messrs. F. Plueckhohn, D. H. Adams, J. H. Neill, and J. Scales; Angaston, Inman Way.

Reports by Branches.

The SECRETARY reported receipt, since previous meeting, of 75 reports of Branch meetings. The Robertstown Branch had been closed on account of members failing to attend meetings.

REPORTS BY BRANCHES.

Murray Bridge, October 25.

Present—Messrs. R. Edwards (chair), W. Wundersitz, H. Schubert, W. Schubert, and W. Lehmann (Hon. Sec.).

MUSTARD CULTIVATION.—Mr. W. Schubert tabled plants of white mustard in bloom; the crop was 3ft. 6in. to 5ft. in height, and he had four acres in as an experiment. He wished to know how the seed should be harvested. [Reap with sickle, tie in small bundles, thrash out on large tarpaulins on the field, or carry to barn whilst weather is cool and damp.—GEN. SEC.]

FARM BUILDINGS.—The subject set down for discussion was "How to erect general farm buildings," but owing to small attendance it was not well discussed. Mr. H. Schubert tabled sketch of ground plan of buildings providing stabling for sixteen horses, a loose box, and chaffroom, which was considered suitable for large stables. The building would carry a hip roof, and could be built so that there was storage for a large quantity of chaff which could be elevated by horsepower from the chaffcutter, and let down by shoots to the stable as required. The doors to the stable should be large enough to admit a dray to remove the manure. Subject to be further discussed at next meeting.

Riverton, October 26.

Present—Messrs. M. Badman (chair), D. Kirk, T. Gravestocks, M. Nash, A. J. Davis, W. B. Davis, W. J. Kelly, H. A. Hussey (Hon. Sec.), and one visitor.

SHEEP ON FARMS.—Mr. A. J. Davis initiated a discussion on this subject. He thought it would be well for all Branches to discuss this subject, as what might suit one district may not suit another, as the soil, climatic, and other local conditions would affect the question of keeping sheep. His own experience was that a few sheep on the farm will always pay; the difference between the value of the sheep killed on the farm and the butcher's retail prices for meat will in twelve months go a good way towards sheep-proofing a paddock. In this district, to make a profit from sheep, at least 600 acres was required; 200 should be in crop and an equal quantity in fallow, besides 200 acres good grazing. Messrs. D. Kirk and W. Kelly supported, and advocated a cross between the Shropshire and Merino for quietness, wool, and lambs.

Wilson, October 26.

Present—Messrs. W. H. Neal (chair), H. Reed, J. Nelson, H. F. Nadebaum, W. H. Neal, jun., A. Smith, and one visitor.

HON. SECRETARY.—Mr. A. Smith was appointed Hon. Secretary.

PLANT FOOD.—Paper read at Congress on this subject was discussed. Mr. Nelson was of opinion that wheat crops did not take so much out of the soil as hay crops. Members generally agreed that it was better to burn stubble in these dry districts, but where there was sufficient rainfall to rot it it should be ploughed under.

HARVEST.—The prospects of the coming harvest were discussed. Regret was expressed that in this district most of the farmers would not reap more than enough for seed and flour.

Rhine Villa, October 26.

Present—Messrs. G. A. Payne (chair), W. Farey, A. Lewis, W. Start, and J. W. Vigar (Hon. Sec.).

FERTILISERS—Members met at Mr. Payne's homestead to inspect his wheat crop, which has been grown under varying conditions. Early varieties only have been sown, viz., King's Early, Early Para, and Steinwedel, and these are well out in head and looking splendidly. Members were of opinion that early wheats were best for this district, but doubted whether fertilisers would give a sufficiently increased return to be profitable on stiff soils with their average rainfall of about 10½ in.

WILD DOGS.—Messrs. Lewis and Farey complained of wild dogs killing their sheep. Mr. Start advised them to build a small dog-proof yard of wire netting in the open paddock and enclose a few sheep in it at night, laying poisoned baits around outside the netting, and making trails in various directions by dragging a red herring. He and his neighbours had adopted this plan with success.

Amyton, October 26.

Present—Messrs. Jos. Gum (chair), A. Gray, W. Gum, Thos. Gum, W. Mills, S. Thomas, R. Brown, W. Hughes, Jno. Kelly, H. Turner (Hon. Sec.), and four visitors.

POULTRY.—Mr. D. F. Laurie's paper on "Poultry for Farmers" (read at recent Congress) was well discussed. Members thought the writer was in error when he stated that the export of eggs could be increased tenfold without lowering the price, as, with present trade, prices are exceedingly low in the glut of the season. They thought that to increase the outturn to the extent mentioned would reduce the average price considerably. A few members thought cross-bred hens would pay better than purebreds, being hardier and more prolific, but the majority held that this class of fowl does not pay for its keep. [In dealing with this question it must be remembered that when speaking of crossbreds first crosses only should be meant. Crosses of crossbreds are mongrels.—GEN. SEC.] Mr. Thomas said it paid him better to go in for eggs alone, as the laying breeds were smaller and consumed less, while poultry for table fetched small prices, no matter what size is sold. Duck-breeding in this district is condemned, owing to scarcity of water and shade. Members consider it unadvisable to run fowls and ducks together. The Langshan cross for table purposes was adversely criticised, as the shape and color are against it.

Craddock, October 26.

Present—Messrs. J. Paterson (chair), J. H. Iredell, W. H. Haggerty, W. J. Glasson, J. Turner, B. Grant, T. Marsh, R. Solly, R. E. Clarke, J. H. Lindo (Hon. Sec.), and six visitors.

IMPROVEMENT OF PASTURES.—A discussion took place on "How to make feed grow on barren land." The Chairman thought barley grass-seed would be good to sow, also "wild mustard," where the land is to be used only for grazing; both could be obtained without much expense, the seed sown broadcast, and harrowed in. Mr. Garnet said horses as well as cattle and sheep will eat wild mustard if compelled to do so by keeping them away from other feed, and they will do well on it. Messrs. Marsh and Iredell thought wild mustard grew only on the richer patches, and would not be profitable to attempt to grow it on the land referred to. Mr. Clarke objected to wild mustard owing to the

danger of it spreading into the cultivated land and choking the crops; he thought the main cause of "barrenness" was the tendency to drift, caused by overstocking and continuous winds. He recommended driving sheep or other stock over the land immediately after rain; this would stiffen the soil, it will cease to drift, and will soon be reseeded naturally. The Hon. Secretary has a paddock of 350 acres that is drifting and barren; he intends sowing native seeds such as saltbush, wild mustard, barley grass, "blueflower," and any others procurable, to prevent it from drifting, and to reseed the land with the natural herbage.

OLD SUPERPHOSPHATES.—Members wish to know whether super. kept over from one season to the next will retain its value if kept in a dry state. [The Inspector of Fertilisers states that there will probably be a slight reversion with well-made super. He has had samples from imported super. over twelve months old that have been reduced from 37 per cent. water soluble to 35 per cent.; the 2 per cent. is still in the manure, but in another form, and is still available to the plants. Unless the super. is kept dry and is well made there would probably be a greater change than this.—GEN. SEC.]

Holder, October 26.

Present—Messrs. J. H. Rossiter (chair), W. Wood, E. Jaeschke, H. Vaughan, F. Rogers, F. Starr, J. J. Odgers (Hon. Sec.), and one visitor.

TYING VINES.—In answer to question, Mr. Vaughan stated he would tie a vine-shoot to a wire temporarily with binder-twine; tying the ends together, he would loop the twine loosely round the branch, and tie to the wire. This enables the plant as it grows to open the string and prevents cutting.

SOWING WHEAT.—Mr. Rogers discussed the various methods adopted here in covering the seed—ploughing, scarifying, or harrowing. Of these ploughing is found best and harrowing the worst. Members considered it best to cover the wheat to depth of about 3in., as in this dry district it gave the plant a better chance if the seed is well covered.

Naracoorte, October 12.

Present—Messrs. S. Schinckel (chair), J. G. Forster, E. C. Bates, E. R. Peake, J. Wyncs, A. Caldwell, G. Wardle, W. C. Hastings, H. Hassler, and A. Johnstone (Hon. Sec.).

CONGRESS AND ROSEWORTHY.—The Chairman reported on proceedings of the Annual Congress and on visit to the Roseworthy College Farm. He thought the crops there seemed promising, though there were a good many patches of red poppy. The cattle were good, mostly three-quarter bred Jerseys, while the pigs were very promising. The horses were a very mixed lot, and had no particular stamp or breed about them. The straw-baling press was very useful and easily worked. Sheep looked well, and the value of manure in improving the pasture was well demonstrated. On land manured for wheat the previous year with super-phosphate the grass could be mown, though carrying a sheep and a lamb to the acre. He was surprised at the absence of sheep on the farms between Roseworthy and Adelaide, especially as he noticed land being fallowed and beautiful grass being turned under. He brought the question of the new Professor of Agriculture travelling more and superintending experiment plots in various parts before the Congress, as outlined in paper read at previous meeting by Mr. Johnstone, but the delegates did not seem to grasp the real intention of the writer. Mr. Thomas inquired as to reason that sheep were not

kept in the North by farmers, and Mr. Hassler stated that the reason given him was that they were too much bother, as they had to bring them in every night. [It would be interesting to hear the opinions of our northern farmers on this matter.—GEN. SEC.] Mr. Wardle thought it was prejudice and the idea that sheep did not pay. Farmers' fences, as a rule, in the North were not sheep-proof, and it would entail considerable expense to make them so. Sheep would pay on most farms.

DAIRYING.—Mr. Forster gave his experiences in sending cream to the Adelaide produce merchants. Very often the returns from equal quantities of cream varied considerably, while the different merchants also returned varying amounts of butter from equal quantities of cream.

WEED.—Mr. Wardle tabled making great headway in the district, and which was not eaten by any stock. The Hon. Secretary said this weed had been identified some time previously as *Ajuga australis*.

AGRICULTURAL SCHOOL.—Mr. Hassler reported satisfactory progress in the experimental work, and would be pleased to see members at the school grounds. Mr. Thomas urged members to take more interest in the agricultural class, and do what they could to work it up, as otherwise he was afraid they would lose it. Members promised to support the class and to visit the experimental plots.

Quorn, October 24.

Present—Messrs. R. Thompson (chair), C. Potter, James Cook, H. Altmann, W. Toll, F. Herde, and A. F. Noll (Hon. Sec.).

CONGRESS.—Mr. G. Walker forwarded a report on his attendance at the Annual Congress in Adelaide, in which he approved of the proposal of the Hon. Minister of Agriculture to establish experimental stations in connection with the Branches of the Bureau in selected localities throughout the State. Even the failures would prove educational as to what to avoid, and successes would encourage others to adopt similar practices. He referred to several other items in the Minister's address in appreciative terms, and recommended members to study it carefully. He thought several of the papers read at the Congress were deserving of most careful attention.

Booleroo Centre, October 23.

Present—Messrs. W. Michael (chair), J. Michael, W. H. Nottle, J. Arthur, J. Black, G. Sargent, A. Milne, W. Brooks, N. Clack, J. Albinus, Dr. Stevens, F. McMartin (Hon. Sec.), and two visitors.

CONGRESS.—Mr. W. H. Nottle reported *re* his attendance at Annual Congress.

PLOUGHING-IN STUBBLES.—Mr. Clack said he had noticed that the land became full of grubs when the stubbles were ploughed under, and these damage the wheat plant seriously. Members generally believe that takeall is more prevalent where the straw is turned under. They are of the opinion that where the land is cropped every year the stubbles should be burned, but if the land is to lie idle for a year or more it is better to leave the straw to decay, and then plough it in. Mr. Brooks wishes the General Secretary to define what is takeall. [Takeall is attributed by mycologists to a parasitic fungus, which destroys the roots of the plants; and this fungus generally works in patches, but may be carried by the plough or other implement in its course across the field. But many farmers give the name "takeall" to nearly everything that causes wheat plants to fail, so that it is difficult to satisfy any particular farmer as to what is really "takeall."—GEN. SEC.]

IMPOVERISHMENT BY USE OF SUPER.—Mr. Brooks wished to know whether use of super. really causes impoverishment of the soil. Members replied that Professor Lowrie, at the late Congress, decidedly stated that the use of super. does not impoverish the soil. [The production of 20bush. of grain through the use of superphosphate, instead of 10bush. where no super. used, will remove from the soil just double the quantity of phosphoric acid, potash, nitrogen, &c., that would have been taken out by the 10bush. There is only a certain quantity of those substances in the soil. It is like an account at the bank. If you have £1,000 there your cheque for £10 reduces the capital to £990; but if your cheque is for £20, then your balance is £980. To maintain the balance at the bank you must deposit from time to time. To maintain the fertility of the soil you must apply fertilisers containing the ingredients removed by the crops. Large drafts require large deposits.—GEN. SEC.]

CROWS.—Mr. Nottle thought all crows ought to be destroyed, because of the damage done by them. Dr. Stevens did not altogether agree with Mr. Nottle. Crows do a lot of good as well as some damage.

Mundoora, October 25.

Present—Messrs. R. Harris (chair), D. Owens, J. Blake, W. J. Shearer, W. Mitchell, J. Loveridge, and A. E. Gardiner (Hon. Sec.).

WHITE HEADS.—White heads are very prevalent in some of the wheat crops, and members are anxious to learn, if possible, what is the cause. [There is evidently failure of pollination, and this may be due to obstruction of the flow of sap through hollow seed bed, called "root-fail" in England, or frost may have killed the flower at the critical time, or hot dry winds may have had a similar effect. If the seed bed is hollow, an examination will now show it. If frost or dry winds occurred at the time of flowering it may be difficult to decide whether or not the cause may be found there.—GEN. SEC.]

CONGRESS.—Messrs. R. Harris and J. Blake reported on their attendance at the Annual Congress of the Bureau, and considered these meetings valuable and instructive. They also visited the Export Produce Freezing and Slaughtering Works, and thought very highly of the same.

Reeve's Plains, October 24.

Present—Messrs. W. H. George (chair), J. G. Folland, Henry Day, Hubert Day, W. Day, E. Hancock, W. Cawrse, M. Richter, A. Modra, A. Arnold, A. B. Jenkins, John McCord (Hon. Sec.), and five visitors.

VISIT TO AGRICULTURAL COLLEGE.—Members did not avail themselves of the general invitation to visit the college, on the invitation of the Minister of Agriculture, in September, as there would be too many farmers present; but they arranged for a quiet visit on Thursday last. Professor Perkins personally conducted the party over the whole farm, and most lucidly explained what had been done in regard to each plot and paddock. One plot of 18½ acres of Tuscan wheat, 16 acres of Dart's Imperial, and 11½ acres of Defiance were exceptionally good, and several other plots were nearly equal to the preceding. A college-selected variety, bearded, 8 acres, was thought by some of the party to be No. 1 Baart, and is a good sort. A paddock of feed here had supported three sheep to two acres, besides other stock and some pigs during the early part of the season, and still there remained some excellent grazing. This was the result of fairly heavy dressing with super. After an interesting inspection of the live stock and the accommodation provided for them the visitors were

refreshed at the college, and then they visited the wine cellars and sampled the wine. If nothing out of the way happens it is expected that the output of wine at the college this coming season will be 10,000galls., and several 1,000 gall. vats are now being fixed up. The wine is of a very light clarety type. A start has been made with some pure-bred poultry from Victoria in raising table birds, and egg-producing breeds have been bred for some time.

HOMESTEAD MEETING.—The party then proceeded to Mr. Henry Day's farm, where his son, Master Elliot Day, is growing several different plots of wheat. The visitors and members were much pleased with the experiments. Thanks passed to the day's entertainers, including Professor Perkins, and it was resolved that it will be advantageous to make these visits annually, if not oftener.

Hawker, October 23.

Present—Messrs. H. M. Borgas (chair), A. C. Hirsch, T. Laidlaw, S. Irvine, and J. Smith (Hon. Sec.).

RUSSIAN THISTLE.—Mr. S. Irvine directed attention to a weed, which was known in America as "Russian thistle," which appeared to have been introduced, and was overrunning large areas. He thought great care should be taken to prevent the introduction of such weeds into this State. [This weed is known botanically as *Salsola kali*, var. *tragus*, and is a native of South Australia, where it is known commonly as "buckbush." When dry it becomes detached from the soil, and bowls along in leaps and bounds, scattering its seeds all the time, lodging against wire fences until a bank of bushes is formed, when the other bushes blow across the obstruction. In America many cattle-owners have concluded that Russian thistle is good forage for cattle, and many South Australian farmers have blessed the buckbush during times of drought.—GEN. SEC.]

PIGS AND POULTRY.—Mr. A. C. Hirsch considers that it will pay well to keep pigs and poultry on the farm. Some people find them unprofitable, because they do not receive sufficient attention. The pigs and fowls should not be allowed to roam all over the place. Fowls at large do not lay as many eggs as those that are kept within limits. Pigs should be put into paddocks for part of the year, to pick up portion of their living, and they should be turned on to the stubbles. He grew crops of peas, cut them before the pods got dry, and fed them to cattle, and the pigs did well on what the cattle left. Both pigs and poultry should be selected from the best breeds, as there were varieties of both classes that would not pay for their keep. Mr. T. Laidlaw recommended all farmers to keep fowls and pigs. He had found that fowls pay well. Mr. S. Irvine also found profit in keeping poultry.

Watervale, October 21.

Present—Messrs. E. E. Sobels (chair), H. Beck, G. Hunter, S. Solly, H. Scovell, H. Ashton, E. W. Castine, and E. Treloar (Hon. Sec.).

WHEAT EXPERIMENTS.—Mr. Hunter tabled splendid sample of Smart's Pioneer Purple Straw wheat, grown by Mr. J. Thomas. It was a very early variety, and a good hay wheat. The grower has about sixty acres, averaging fully 5ft. 6in. high.

STOCK COMPLAINTS.—Several residents have lost odd cows at different times of late, and Mr. Solly reported that three apparently healthy young animals died within three or four days. He got Stock Inspector Needham to come across and see the last one that died, and that gentleman attributed the trouble

to spinal paralysis, which often accompanies dry bible or impaction. He stated that it was useless attempting to treat bad cases, but preventive action should be taken by giving occasionally Epsom salts and ginger (1lb. salts and 1oz. ginger), and giving the horses brackish water. The meat from affected animal was quite fit for human consumption, being free from any disease.

POPPY.—Mr. Treloar tabled two different wild poppies found in the district, one having small round pods and the other with long pods like beans; the foliage was also different. Some members thought the weeds had been introduced with the fertilisers used, and wished to know if such was the case, as it had appeared in some paddocks where it had never been seen previously. [The commercial fertilisers do not contain weed seeds; the treatment necessary in making these fertilisers would destroy the vitality of any seeds that might be introduced with the raw materials. If second-hand wheat-bags are used it is, of course, possible to introduce weeds. Poppy seeds are very small and light, and are readily distributed by the wind, in chaff or hay or seed wheat.—**GEN. SEC.**]

FUNGUS COMPLAINTS.—Several members reported having sprayed their peach and apricot trees, for the prevention of curl leaf and shothole, with beneficial effects, these diseases being very bad, as a rule, this year.

Hahndorf, November 2.

Present—Hon. A. von Doussa, M.L.C. (chair), Messrs. C. Bom, T. H. Sonnemann, T. Grivell, G. Sandow, H. Spoechr, P. Schubert, J. C. Rundle, and D. J. Byard (Hon. Sec.).

BUTTER-BOXES.—Members regret to note that the timber used in making butter-boxes is subject to duty, as it is not grown in any of the States, and the duty is prejudicial to the dairy industry.

PINNAROO.—The Chairman mentioned his visit to the Pinnaroo lands, now proposed to be opened for agricultural occupation. For past five years the average annual rainfall has been 15in. to 18in. Horse-breeding could be carried on successfully, but sheep do not thrive. The proposed railway would prove advantageous also to similar adjacent country in Victoria, which at present has no outlet for its produce.

WALLAROO SUPER.—The Wallaroo Superphosphate Manufacturing Co. presented samples of super., which will be tried by six members.

Appila-Yarrowie, October 25.

Present—Messrs. J. C. W. Keller (chair), C. W. H. Hirsch, A. Fox, J. H. Bottrall, W. Stacey, E. Catford, W. C. Francis, R. G. Grant, G. A. A. Becker, C. G. F. Bauer (Hon. Sec.), and two visitors.

CONGRESS.—Delegates reported on their attendance at the Annual Congress, also upon visit to the Agricultural College.

SHOW.—A sub-committee was appointed to make arrangements for holding a Branch show early next year.

HOMESTEAD MEETING.—Present meeting took place at Mr. W. Stacey's farm. Members thought his chaffhouse was well arranged. Doors open on to the stack yard, and the chaffcutters can be supplied from either side. The chaff store is commodious and well arranged. The stables are adjacent and the mangers are filled from the back. Each compartment of the stable accommodates two or three horses. The horses are a fine lot, and include a very promising two-year-old entire. The wheat crops will probably give a

good yield. A bag of a variety called "Solid Bluey" was sown, but appears to be rather late, although it promises well. All buildings are of stone, with galvanized iron roofs; and all implements—even the roller—are housed. The barn is also used as a shearing shed, and the sheep yards are very convenient and well arranged. The members appreciated the nice meal provided by Mrs. Stacey, and then visited a neighboring farm where only 50lbs. of super. has been used to the acre of wheat, of which there will probably be a crop of 18bush. to 20bush. per acre. A crop belonging to Mr. Stacey had no fertiliser, and will probably yield 20bush. to 25bush. per acre. He crops with wheat about once in three or four years. When this district was a sheep run, it maintained about 8,000 sheep; now the farmers keep about the same number, besides horses, cattle, and pigs, and they cultivate a good area with wheat and other crops.

Eudunda, October 25.

Present—Messrs. J. von Bertouch (chair), F. W. Paech, M.P., C. Wainwright, H. Hage, F. H. Walter, W. H. Marshall (Hon. Sec.), and one visitor.

ANNUAL REPORT.—This was the tenth annual meeting, and the Hon. Secretary reported on work done since the first. During the past year nine meetings had taken place, with an average attendance of seven. Three papers only had been read, and a number of seeds had been distributed for trial. A public meeting had also been arranged to hear a lecture on "Poultry-keeping," by Mr. Wyllie, of Kapunda. Mr. A. Kluske, who had been a most zealous member for ten years, died during the past year. The General Secretary, in Adelaide, had given much information through questions submitted by the Branch. During the past five years that Mr. W. H. Marshall has been Hon. Secretary he has raised and distributed free of cost no less than 3,000 trees of various kinds to members and others, and 75 per cent. of these are growing. He has also given away 4,000 rooted vines. Since the Government grant for the experimental block at Eudunda has been withdrawn, the Branch has carried on experiments at its own expense, and the late Mr. A. Kluske had deserved much gratitude for his work. The cost of these later experiments has been about £20, and the results have been distinctly helpful to farmers in the district, principally in introducing drought-resistant wheats. Summer fodder had also been grown and the practice adopted by several farmers. The local Agricultural Society was inaugurated by the Branch members, and has caused an improvement in live stock and in other directions.

OFFICERS.—The Chairman and Hon. Secretary were thanked and re-elected, and Mr. C. Wainwright was elected Vice-chairman.

Redhill, October 22.

Present—Messrs. D. Lithgow (chair), W. Stone, R. H. Siviour, A. A. Robertson, H. Darwin, F. Wheaton, D. Steele, A. McDonald, A. E. Ladyman, J. N. Lithgow (Hon. Sec.), and two visitors.

MILITARY REMOUNTS.—Mr. R. H. Siviour read a paper, "Will it Pay to Rear Horses Suitable for Military Purposes?" to the following effect:—

He attended a horse sale recently in Adelaide, and was surprised to see prices ranging from £25 to £45 for horses of this class. He thought every one would agree that it would pay better to breed horses at these prices than to grow wheat for 2s. 6d. per bushel. The breeding of horses of this stamp ought to be more general. The buyers invariably rejected flat-sided, badly ribbed-up horses. From what he had observed there is no market for the half-thoroughbred weeds, which only bring from £5 to £10 each; yet it costs just as much to keep such as it does to maintain the higher-priced animals. He did not condemn the thoroughbred, as he was

convinced that an ounce of blood was worth a pound of flesh at the end of a long day's journey. But often the only recommendation of the stallion is that he has a thoroughbred pedigree and has won a race. Although a racehorse may be pure, everything else may be sacrificed for speed. The thoroughbred sire must have a good constitution, an intelligent head set on a well-formed neck, must be well ribbed-up, have good girth, and a fair width of chest, supported by muscular limbs carrying good bone and hoof. The mare should be bony, with thick and short legs—for it is from the dam's side that bone and substance should be found—to combine with the quality of the thoroughbred sire. A brood mare should have good action and be free from disease. He would recommend a four-year-old filly, sired by a thoroughbred horse out of a cart mare; but thought perhaps another cross of thoroughbred might have a better result, except when the mare is too small and weedy. It is said "A good horse never has a bad color," but for remounts the favorite colors are bay, black, or brown. There is no demand for horses of light colors, owing to their visibility at long distances, and thus making them targets for the sharpshooters. Height, 14½ to 15½ hands, able to carry 15 stone. A good horse always brings a good price.

Some members thought the market for such horses is too unreliable, and it is difficult to produce a horse of the right stamp. After having selected what what was thought to be the right sire and dam, the progeny is often weedy. Sometimes haphazard breeding resulted in a good horse. On a vote being taken, there was a majority of one against the contention of the paper.

Stansbury, November 2.

Present—Messrs. Alex. Anderson (chair), C. Faulkner, J. Sherriff, J. Antonio, P. Anderson, J. Henderson, and J. Germain.

LATE SOWING.—Hon. Secretary reported that he had sown plots of wheat experimentally on October 18th, one plot manured with Lawes' super. and the other with Wallaroo super. Both plots were doing well.

FEED.—The late rains have greatly improved the natural pastures.

ALGAROA BEANS.—Mr. Jas. Sherriff said one seed only of Algaroba bean had germinated.

Port Pirie, November 2.

Present—Messrs. E. J. Hector (chair), H. B. Welch, G. M. Wright, T. Gambrell, F. Humphris, W. Smith, T. A. Wilson (Hon. Sec.), and one visitor.

CONGRESS.—The Hon. Secretary reported on proceedings of Congress, and pointed out that through an oversight the names of Messrs. J. Lawrie and H. B. Welch were omitted from official report of members attending the Annual Congress. He also suggests it might be possible to arrange for a meeting of Hon. Secretaries of Branches during the Congress week to discuss with the General Secretary how best to increase the usefulness of the Branches and other matters connected with the work of the Secretaries. [If this could be arranged much good should result. The difficulty, however, would be to find time for such a meeting. Will Hon. Secretaries consider the matter and let me have their opinions on it?—GEN. SEC.] Mr. Wright reported on visit to the Roseworthy College Farm. There was a certain roughness and lack of finish very noticeable about the place, and the farm was, in his opinion, anything but a model one.

STICKY SUPERS.—Discussion on various brands of superphosphate took place, and certain brands of a sticky nature were strongly condemned.

LATE SEEDING TO WHEAT.—Mr. Smith stated that in April he drilled in seed and manure together, but, owing to the long spell of dry weather following, most of the seed malted. On August 3 and 4 he re-sowed, broadcasted the seed, and covered it with a cultivator; from present appearances he expects to reap two bags per acre.

BUDD'S RUST-RESISTANT WHEAT.—Mr. Budd explained the origin of this wheat. From a badly rusted mixed crop of Fillbag, Defiance, and Tuscan wheats he gathered six clean heads. These he cultivated for several years, and getting a supply he sent some down to the Central Bureau, explaining the circumstances, and it was then distributed to the Branches under the name of Budd's Rust-resistant. It was in no way connected with Ward's Prolific or the variety known as Budd's Early.

FORESTS AND RAINFALL.—Mr. Jose replied to criticisms on paper read at a previous meeting. He was pleased with the criticism, adverse and otherwise, but would have preferred members to have given their personal opinion rather than quote other members. Some of the members had apparently based their remarks on the paper as it appeared in the *Journal*, but, owing to being much curtailed, it was scarcely a fair account. He did not say that trees would make rain, but that all living trees, bushes, &c., worked in harmony with other works of nature. They give off a large amount of moisture in performing the natural functions, and this is taken up by the atmosphere and carried over the country, plain as well as forest land, and undoubtedly conduces to increasing the rainfall. A member had given Canowie as an instance of a good rainfall without trees, but forgot apparently that some of the largest forests and best timbered land in the state existed within a few miles of that station, and also that elevation has a great deal to do with rainfall; Canowie was 2,000ft. above sea level, and this naturally must make some difference to the rainfall. There was more importance to be attached to Goyder's line of rainfall than many people imagined; if examined closely it will be found to include almost all the gumtree country, and he was doubtless guided by the trees in laying down this line. Leaving the question, however, of the actual effect on the rainfall, would it not be much better in some localities now bare of trees if some were planted in rows or clumps for shade and shelter, and to keep the wind higher off the surface of the ground to prevent the drifting of so much of the top soil. Mr. Hector thought Mr. Goyder followed the saltbush country rather than the timber in fixing the rainfall line referred to.

Richman's Creek, October 28.

Present—Messrs. W. Freebairn (chair), A. Knauerhase, J. J. Gebert, E. Roberts, J. J. Searle, W. J. Wright, F. Mattner, J. McSkimming, J. M. Kelly, A. Nicholson, J. A. Knox, J. McColl (Hon. Sec.), and one visitor.

PLOUGHING.—The Hon. Secretary read the following paper on "Wide or Narrow Lands: Which are the Best?" :—

In the southern parts of the State, where the rainfall is much heavier and more reliable, lands have often to be ploughed very narrow for the purpose of draining off surplus water; but in our dry northern districts, instead of draining we have to conserve in the soil all the moisture possible. Some twenty-five years ago, when the surrounding district was broken up, most of it was ploughed in chain lands; when the seed was sown by hand it suited well, but when the seedsower came into general use twenty and forty yards lands were found more convenient. Some plough round the whole paddock until they finish in the middle, but I do not think this is likely to become general. Very often the soil becomes too hard before the paddock is finished, and weeds run to seed, and being in the middle of the paddock it is almost impossible to destroy them. There are a good many others who mark out strips several chains in width and plough round the ends in turning. The soil can be equally as well ploughed as if worked in narrow lands, and in much less time. To a large extent the width would depend on the length of the paddock and the slope of the surface. When the length is about 30 chains we find it convenient to take 4 chains at a time. In hilly country, where in places the slope may be steep, the width would vary so as to avoid, where possible, turning the furrow uphill. On level country the lands could be made any width desired. If the situation is suitable and the ploughing can be started on the side of the paddock furthest from the homestead, the team can plough round one headland in going out in the morning

and return on the other at night, thus getting over a good deal of ground that would not otherwise be done in the time. To mark the paddock off for the seedsower a very convenient method is to have two horses, one with traces to which a drag is attached, light, but sufficient to leave a good mark, with a strap around the horse's neck to which is tied a light rope sufficient to reach the width required for the sower. With two active horses and a rider on each a paddock can soon be marked off. In ploughing wide strips you can get over a good deal more ground than if ploughed in narrow lands; time saved in marking out and also in finishing. Then, with the drill coming into use, my experience is that the fewer the furrows and the shallower they are the better, as it is almost impossible to cover the seed properly where the drill is following a furrow, unless it is very shallow and the soil loose.

Mr. Gebert said that where there was a hill he generally ploughed around it, turning the furrow down hill when possible, as the weeds were destroyed better. Mr. Knauerhase agreed that the weeds might be covered better by turning the furrow down the slope, but he found it difficult to keep the plough in the land in doing so. The Chairman said much depended upon each one's farm. He did not consider narrow lands necessary if the land can be ploughed in wide strips. Mr. Wright generally ploughed three-chain lands, and backed up one-half, but did not plough round the ends. A little time might be saved in doing so; but he preferred ploughing a headland, and thought in the after-working of the fallow across it could be worked better in this way. Mr. McSkimming liked to work his land across occasionally, and thought it better not to have the lands too wide.

LOCUSTS.—Mention was made of the damage to some wheat crops by locusts, which, it was stated, bred in great numbers on the travelling stock reserve, from which they attacked the adjoining crops.

Bowhill, November 3.

Present—Messrs. J. T. Gregory, W. Towill, E. P. Weyland, J. McGlashan, T. H. Baker, J. Waters, G. A. Prosser, J. G. Whitfield (Hon. Sec.), and one visitor.

WHEAT EXPERIMENTS.—Mr. Gregory reported that Bartlett's Cross-bred wheat was not doing very well—it was inclined to fall down—and in his opinion was good only for hay. Gravestock's Frampton was a good variety, but Dart's Imperial was a very slow grower, and late. Mr. Towill found Dart's Imperial a prolific variety, if sown early and on sandy land. Gravestock's Frampton was also good, being similar to Steinwedel, but does not shake out. Mr. Baker found Dart's Imperial a good wheat, but bad to reap, choking the combs.

MARRAM GRASS.—Mr. McGlashan wished to know where to obtain Marram grass. [Write to Mr. G. H. MacMillan, Normanville. Plants may be raised from seed, but division of the roots is much quicker and more satisfactory. Roots should be planted in May or June.—GEN. SEC.]

Port Germein, October 24.

Present—Messrs. G. Stone (chair), E. G. Blesing, W. Head, J. K. Deer, D. Thomson, E. McHugh, and A. H. Thomas (Hon. Sec.).

DAIRYING.—Paper by Mr. G. S. Thompson, Dairy Instructor, in September issue of *Journal of Agriculture* on "Instruction to Milk and Cream Suppliers" was read and discussed at length. Members consider his remarks in many cases very strongly put, and they are not applicable all round. The great majority of dairymen are not such a dirty class as Mr. Thompson's remarks would infer, and members regret statement calculated to injure the dairying industry should have been published in the *Journal*. Members consider that

managers are to blame if they accept inferior milk or cream; they should exercise their powers and reject such. Mr. Thomson's suggestions as to yards and sheds were considered impracticable in this district. Most of the cows are milked in the open without being yarded, which members consider the best way. Many of his remarks on this subject are only applicable where the cows are stall fed. They agree as to the necessity for care and cleanliness in milking, cleaning of dairy utensils, brushing and wiping the cow's udder before milking, and otherwise preventing the contamination of the milk. In regard to separators, a skilled mechanic is not necessary, as any practical man can work one satisfactorily.

WEEDS.—Mr. Blesing tabled two weeds for identification, one being a species of *Silene*; the other was not known, but Mr. Blesing said stock would not touch it, and nothing else seemed to grow where it got a hold.

Woolundunga, October 15.

Present—Messrs. J. Greig (chair), N. J. Rogers, J. H. Michael, G. Foulis, J. O. Walker, R. Blyth, H. Aldenhoven, J. Grunike, T. H. Prosser, N. Rogers (Hon. Sec.), and one visitor.

ANNUAL CONGRESS.—Mr. Prosser reported on proceedings of Congress, and the Hon. Secretary on visit to Roseworthy College. Mr. Greig read the following paper:—

In writing on this subject I am well aware that it is one on which there is considerable diversity of opinion. Some maintain that it is valueless except in so far as it obtains for members of branches a free ride to the city, whilst others consider that it does untold good. After having been at the Annual Congress over twelve months ago, and again about a month since, I have come to the conclusion that it does a very considerable amount of good. In the various subjects that are discussed we become acquainted with other people's views, who probably look at the matter from an altogether different point of view to what we have been in the habit of doing. Thus our views of matters are widened, and a more general knowledge of what is being done in the State is obtained. It is a well known fact that those who stay at home and plod along in the same old groove become narrow and exclusive, if not bigoted, and are not by any means the people who do most to advance the general interests of the State. In attending the Annual Congress one meets with people from all parts of the State, and of the most widely divergent views; so that it is hardly possible for one to attend the Annual Congress and intelligently listen to the discussions without gaining a considerable amount of information and getting hints that will help them in their business. Then, as part of the Congress, there is the trip to the Produce Depot at Port Adelaide and to the Agricultural College at Roseworthy. I had the privilege of taking the trip to Roseworthy College, and was much pleased with what I saw and heard. Here I would like to pay a tribute to Professor Lowrie for the manner in which he met us and showed us around the farm, the trouble he took to explain matters, his courtesy to all, and his evident desire that there should be no misunderstanding of the result of his experiments so far as he had been able to carry them out. Under these circumstances it would be impossible to go the round of the college farm without gaining a great deal of knowledge, both as regards agriculture, cattle, sheep, pigs, &c. In view of the above facts I believe that the Annual Congress does a vast amount of good, and even though the cost to the State and to members may be considerable, it is far outweighed by the advantages that accrue. I am, therefore, a firm believer in the Annual Congress. But at the same time I am of opinion that the Congress might be better than it is. Not but what the papers read are good, and afford ample room for discussion; the trouble is that many of the papers read and the discussions that follow cannot be heard. There are various reasons for this. First, the unsuitable halls in which the Congress is held. The one used in 1900 was simply execrable, being a long narrow room, with the chair against the wall midway along the room; and it was amusing to see people look round to see who was speaking behind them, when it was only an echo. The hall used at last Congress was better, but still its acoustics are very defective. Second, the private conversation carried on between members (and they are not altogether to blame for this, for it is a severe tax on one's patience to sit for, say, half an hour, straining your ears to try and hear what is being said). The talking amongst members is, as a rule, the result of not being able to hear what is said. Then we have an able, energetic General Secretary, who performs part of the Chairman's duties, and thus creates a divided control of the meeting, which is not conducive of good order. If our

highly-esteemed and respected Chairman of the Central Bureau finds the arduous duties of chairman too great a strain—and they are a great strain—would it not be well to get another strong chairman to take charge at some of the meetings, and thus give our worthy Chairman a much-needed rest and secure better order at the meetings. Then I would suggest that those at least who read a paper should go to the front and face the audience, instead of speaking with their backs to them. I would further suggest that members try and recollect that they are not at home in their own Branch meeting talking to half a dozen people, but in a large hall where hundreds expect to hear what they are saying; and if they do not hear they will talk to one another, and so prevent others from hearing. At the last Congress there were some gentlemen who spoke who either had no voice or they were afraid to use it. If the former, I should recommend them not to bore others by attempting to speak in public; if the latter, the sooner they overcome their diffidence the better it will be, both for themselves and their hearers.

APRICOTS.—Mr. Greig tabled two branches from an apricot tree, one with shoots 15 in. long, and the other only 1 in., and with the leaves curled. Members attributed this to blighting winds.

HOMESTEAD MEETING.—This meeting was held at the homestead of Mr. J. H. Michael. The garden, which last year was stripped by locusts, is looking well now, and as it was flooded only a few days previously, the fruit is likely to be good. Like the rest of his neighbors, Mr. Michael is suffering from the effects of the drought. There is no wheat or hay, and no feed for cattle, consequently most of the latter have been disposed of. Members, with their wives and lady friends, were entertained at tea by Mr. and Mrs. Michael, who were thanked for their hospitality.

Brinkworth, October 25.

Present—Messrs. A. L. McEwin (chair), J. Cross, G. Wooldridge, G. Freebairn, W. H. Pearce, J. F. Everett, A. W. Morrison, G. Ottens, W. Wundke, S. Aunger, J. Stott (Hon. Sec.), and twelve visitors, including Mr. G. S. Thomson (Dairy Instructor) and Mr. Geo. Jeffrey (Wool Instructor), School of Mines.

SHEEP FOR MEAT AND WOOL.—Mr. G. Jeffrey described the qualities of the various breeds of sheep in respect to their carcasses and their wool. A sheep was shorn by Mr. J. Cross, and then the instructor gave a practical illustration of the proper manner in which the fleece should be skirted, folded, &c., from beginning to end. Many questions were answered, and much instruction gained by those present.

DAIRY MATTERS.—Mr. G. S. Thomson gave a short address upon current dairying topics, and answered a good many questions.

Wilmington, October 29.

Present—Messrs. J. Hutchens (chair), R. Cole, W. Slee, J. Zimmermann, J. Hannigan, H. Noll, J. Schuppan, J. Lauterbach, and R. G. S. Payne (Hon. Sec.).

ONIONS AND POTATOES.—The Hon. Secretary read a short paper on the profits of onion-growing. He contended that most farmers had the opportunity of adding to their income by the cultivation of an acre or so of onions. While the cultivation was more laborious, the returns were more certain than from wheat. The soils, treatment, varieties to plant, and season for planting, were referred to. A lengthy discussion ensued, it being the general opinion that it would be worth the while of farmers, in suitable localities, testing for themselves the question as to whether onion-growing on a small scale would pay. One member stated that he had grown a third of an acre of Queen onions this year, and had sold the growing crop for £25. The Hon. Secretary tabled specimens of Beauty of Hebron potatoes, which were much admired. From half a rod of ground, heavily manured with bonedust and sulphate of ammonia, he dug 67 lbs. of large potatoes.

FERTILISERS.—Mr. Zimmermann called attention to the necessity for seed and fertiliser drills being fitted with some contrivance to enable the operator to regulate the quantity of manure distributed whilst in motion. Mr. Slee reported that in his opinion he would not profit from the application of super. up to 2cwts. per acre. He was strongly in favor of using this fertiliser, but on the rich lands of Gregory and Willochra thought that crops receiving 70lbs. to 80lbs. per acre looked equally as well as those receiving heavier dressings. It was decided to make a tour of inspection of the crops treated with the different fertilisers, instead of holding usual meeting in November.

Koolunga, October 24.

Present—Messrs. T. B. Butcher (chair), J. Button, J. Sandow, G. Cooper, W. T. Cooper, J. Jones, G. Jose, and J. C. Noack (Hon. Sec.).

FARM LIFE.—The Chairman read a paper on this subject, as follows:—

I have been tempted to take up this subject by hearing so many remarks and reading so much in the *Journal of Agriculture* and elsewhere about the matter. A paper was read recently at a meeting of a neighboring branch wherein the writer inclined to deprecate the advantage of farm life. I maintain that it can be made the happiest, purest, most enjoyable, and certainly the most independent of occupations. Remarks about the "drudgery" of farm life have a tendency to depreciate and undervalue the importance of the occupation. There is no calling or occupation of more value to the world than that of the agriculturist. There is no necessity to become "slaves" to the situation. To cultivate the soil thoroughly requires a certain amount of work, as well as practical knowledge of how and when to do the work. The wise man said, "to everything there is a season, and a time to every purpose under the heavens," implying a time to eat, a time to sleep, a time to work, and a time for recreation or mirth. In order to accomplish the desired end farmers should keep well abreast of the work, and not be continually behind. When the season comes for cropping be ready for it, and pay every attention to it during the few weeks it lasts; then, if the farmer and his sons or employés want a day or two off, it can be arranged before fallowing is commenced. The same applies between fallowing and hay harvest, and between the hay and wheat harvest. If the young men on the farm want a half-holiday for football, cricket, or other healthy recreation, it can usually be arranged without any great inconvenience. A little time spent in recreation is not lost; it will stimulate the youth to greater activity, and fit and prepare them for the responsibilities of life. Farm life to-day can be made one of the easiest, healthiest, purest, and most enjoyable of occupations. It is free from the sins and temptations of city life. Compare its ease with that of thirty years ago. Imagine the farmer tugging away with the old scythe, enough to cripple the strongest of men. To-day we simply sit on the seat of the mower, driving two or three horses; we have the up-to-date rake, which a man or boy can ride, and, by pressing a spring with the foot, the rake is self-adjusting, instead of having to be worked by a lever by the farmer walking behind the machine. Then the stripper takes the place of the sickle; the bag-loader and bag-lifter are worked by horsepower; the broadcast seed-sowers and the drill take the place of the old method of walking and sowing by hand, carrying the wheat in a tub or seed-slip suspended from the shoulder. Then again, we have up-to-date ploughs and scarifiers with seats, so that the driver can ride, instead of having to walk all day. I maintain that the days of "drudgery," as applied to farm life, are gone. The work in connection with farming thirty years ago was heavy and laborious, but, thanks to the modern inventors, this is changed, and what was the hardest part of the work is now the lightest and easiest. When we hear people talking about the drudgery, and in other ways deprecating farm work, we may be sure that it is for want of a good knowledge of what farm work really is. We sometimes hear remarks about the farmer's dress. The farmers, like other people, dress in what is most convenient for their work, and after working hours in what suits their taste, convenience, and income. [While the city man has to swelter in stiff shirts and collars and clothes unsuitable to the climate because, forsooth, it is the "fashion."—GKN. SEC.] Sometimes people talk of farmers living on eggs and bacon; perhaps these people covet the bacon. The farmer, above all people, has the means at his disposal to change and vary his diet to suit his taste, having most things available on the farm.

In conclusion, let us all make our homes attractive and interesting to the young people. It can be done, and there are various ways of helping. In my opinion one of the chief is to give them, when growing into manhood and womanhood, monetary interest in their work. I do not approve of keeping our sons as "boys" until they are 30 years of age, or thereabouts; offer them inducements, to encourage and benefit them. For instance, give them a certain

percentage of the crop in return for their work, and let them market it themselves if they like; or give them the privilege of breeding a foal or two, or keep some calves, or sheep, or poultry, whichever is most convenient and accessible. Let them do their own business in disposing of their products, as it will be the means of developing their business capabilities and fitting them better for the responsibilities they must take on themselves sooner or later. Youth is the time to acquire knowledge. Some of our conservative fathers might say the boys will make a mistake in dealing. Well, one of the most forcible ways of teaching or learning lessons is to "touch the pocket," and if they make a mistake they will be very careful not to make another if they can avoid it. Who amongst us have not made mistakes in dealing? Seasons or conditions have changed other than we expected and the deal has not been profitable. So I say let us give the same consideration to our sons as we would like ourselves.

Members complimented Mr. Butcher on his paper, agreeing more or less with it. It was generally thought wise to allow the sons a certain percentage of the profits to interest them in their work, and also that farming was one of the happiest, freest, and most independent of occupations; though some members thought there was quite sufficient hard work attached to it, and often there was not a fair profit for the work.

Mannum, October 28.

Present—Messrs. R. P. Scott (chair), J. A. Schulze, R. Heidrich, J. W. Walker, and W. H. Quartly (Hon. Sec.).

BUSINESS.—The apathy of members and the few subjects discussed during the past few months was commented on. It was decided that the current issue of the *Journal of Agriculture* be laid on the table at each meeting, and that individual members endeavor to prepare papers or initiate discussions on various matters referred to therein.

Pine Forest, October 22.

Present—Messrs. W. H. Jettner (chair), F. Masters, G. Inkster, A. Mudge, and R. Barr, jun. (Hon. Sec.).

ATTENDANCE.—Hon. Secretary was requested to inform all members that the rules will be enforced, and that the name of any member failing to attend for three consecutive meetings without sending a reasonable written excuse will be struck off the roll.

CONFERENCE.—A conference of North Yorke's Peninsula Branches is to be holden at Bute during February next, Bute Branch to make arrangements for papers, exhibits of produce, and home industries, &c.

CONGRESS.—Mr. F. Masters, one of the delegates to the Bureau Congress, read the following report:—

One pleasing feature in connection with the Congress proceedings was the improvement in decorum observed. While there is room for further advancement still, the courtesy shown speakers at the latest Congress compared most favorably with that of its immediate predecessor. The papers read were excellently prepared, and although subjected to a deal of criticism, survived the ordeal in the main, but a few minor points losing the acquiescence of the majority. The Minister of Agriculture in his opening speech intimated that a further reduction of 15 per cent. in the freight of manures carried over the Government railways had been decided upon. The Chairman (Mr. Krichauff) indulged in a retrospect of the work accomplished by the Bureau, and that speech is well worthy of thoughtful perusal by every member of the Bureau, and should prove an incentive to our future work, so that what is already accomplished shall not dwarf that yet to be done when another retrospect may be taken years hence. Analyses of soils was touched upon in a paper on "Plant Food," in order to find out their constituents and see what manure was needed to grow a certain crop. There are many difficulties in the way of chemical analyses to the average farmer, who, however, can find out by experimenting what is lacking and necessary. Professor Lowrie delivered his valedictory address to the farmers, and impressed upon them the necessity of following, manuring, and keeping sheep and pigs. The increased crops from fallow land were not soely due to the moisture conserved, but also to the numberless ferment organisms set up thereby. He considered also if there were no increase in the wheat crop it would still pay to manure because of the benefit afterwards to the feed. The Professor was the recipient of an illumi-

nated address, a pipe, and a walking stick from the Bureau of South Australia, while Mr. Krichauff, who might almost be termed the "father of agriculture" in South Australia, received a token of the high esteem in which he is held by the agricultural community. Mr. Grasby dilated upon a scheme for the "Increasing the Usefulness of the Bureau." The scheme is to be referred to the Branches for consideration during the year. Striking as it does at the constitution, great care must be taken in considering the question and in deciding whether such drastic changes as suggested are necessary or not. Let me urge each member not to approach the question in any vacillating spirit, but give the subject the thought worthy of the occasion. Amongst other points discussed at the "Free Parliament" were broadcasting manure v. drilling same, circulating libraries for Branches, and the ubiquitous crow. The paper by Mr. Laurie, the poultry expert, on "Poultry for Farmers," contains much valuable information on a much-neglected branch of our calling, and I would remind my fellows that Mr. Laurie's advice can always be obtained upon any intricate point in connection therewith by sending him a stamped envelope for reply. The Produce Depot and Freezing Works at Port Adelaide were visited, and although only wine and a small number of lambs were in the Depot, yet the arrangements were seen to be the most effective possible and capable of dealing with a large volume of trade. Capacious chambers, proximity to wharf, and a live manager are prominent points which contribute to its success and induce trade. All facilities for slaughtering and dealing with lamb carcasses and offal were found at the Dry Creek slaughtering establishment. The annual visit to the Roseworthy Agricultural College was well worth taking, and the experiments with the various wheats, the pickling tests of bluestone, hot water and formalin, and the tests being made relative to methods of sowing wheat, quantity of seed per acre, quantity of manure per acre, and the various kinds of manures were interesting, and the results will be eagerly awaited at harvest time. On the thinly-seeded plots the broadcasting has a slight advantage in appearance, but this is reversed in the thick-seeded plots. In the quantity of manure used test, the heavier dressing of 2 cwt. v. 1 cwt. per acre has the advantage. The efficiency of phosphatic manures was again demonstrated in the trial of the various manures; nitrogenous manures having no beneficial effect on the crop. The wheats Warwick and Jerkin, two of Mr. Farrar's wheats of New South Wales, were considered the best on the college farm. The Calcutta oats promised a capital crop, and in fact all crops there promised exceedingly well with a rainfall up till date of visit of 13 in. In sheep, the cross Dorset Horn-Merino produces good fat lambs for market and freezing, and the Berkshire pigs were greatly admired, as also the Jersey herd of cattle. The statement of the Professor regarding the after effect of manuring was fully borne out by the food on the farm. Among other things growing at the college were noticed the Carob bean (not yet in bearing), a tree that might with advantage be planted as a standby during times of drought by farmers, and the much-neglected saltbush, which, planted and stocked judiciously, will yet save the arid North from the dire consequences of the visitations of drought that have occurred in recent years. Another plant which possibly would thrive with us here was the tree lucern, a good fodder plant, thriving on sandy soils and forming a pretty hedge.

COST OF WHEAT-GROWING.—The Hon. Secretary presented the following statement of the cost of cultivating wheat in this district on a farm of 1,500 acres, one-third under crop each year, fallow one-sixth, taking two crops in succession, and leave out of cultivation for four years:—

EXPENDITURE.		£	s.	d.
Rent and water rate on 750 acres, at 6d per acre		18	15	0
District council rates and taxes		10	0	0
Seed, 250 bushels at 2s. 6d.		31	5	0
Labor, £150; super., 18 tons, £90		240	0	0
Blacksmith and saddler		17	0	0
Interest and depreciation on £400 worth of stock		53	0	0
Sacks and twine, £25; part interest on improvements, £13		38	0	0
		<hr/>		
		£408	0	0
REVENUE.				
Four hundred and fifty acres, at 8bush.		£450	0	0
(Fifty acres reserved for hay.)				

On the balance of the holding 200 sheep can be kept. They should return yearly for wool £33, which should pay the remaining £18 15s. for rent and water rate, and £14 5s. for interest on fencing, &c.

Mr. Masters considered that neither sheep nor any other product should be dragged into an estimate of the cost of wheat-growing. The Hon. Secretary doubted whether an 8bush. average could be obtained without sheep, except at increased cost for labor, as the sheep kept the weeds down more effectually than by cultivation.

Mount Bryan East, October 26.

Present—Messrs. A. Pohlner (chair), Wm. Quinn, jun., J. Honan (Hon. Sec.), and one visitor.

SHEARING.—After discussion, members were agreed that the best time to shear sheep is in October. If shorn earlier the sheep are liable to much suffering from cold weather.

CROPS.—Early-sown crops are thin, on account of the seed having been malted in the ground.

LOCUSTS.—Locusts are very numerous in some parts of the district.

Ardrossan, November 2.

Present—Messrs. G. Freeman, S. Alderman, J. Henderson, R. Dinham, C. Canc, and N. Opie (Hon. Sec.).

PICKLING SEED WHEAT.—Mr. Henderson always pickles his seed wheat, using 8ozs. bluestone (sulphate of copper) in 4galls. of water, which is enough for 4bush. of seed. Since the advent of the seed drill, which apparently breaks the balls of bunt and reinfects the seed, he floats the bunt out of the seed, a dishful at a time, in the bluestone solution. This is slow work, but he obtains another advantage in skimming off light seed and rubbish with the bunt balls. Mr. Dinham uses 16ozs. bluestone in a 200gall. tank that has been coated with tar, to prevent damage to the iron by the bluestone. He dips about 1½ bush. of seed at once, leaves it in soak fifteen minutes, then dries it, puts it through the winnower to blow out the light rubbish, and places it in new bags. Thoroughly matured grain should be selected for seed, and it should never be bunted, if it can possibly be avoided. Members want to know why self-sown crops are never bunted. [Because the slightest degree of moisture causes the spores of bunt to start growing. When wheat grains fall to the ground, even if badly dusted with bunt spores, the plant will not be affected, because the bunt spores started to grow when the dews fell, or after a light rain, or through slight moisture in the soil; but the wheat plant did not start, and the parasite (that is, the bunt) died for want of a host plant to live upon.—GEN. SEC.]

Morphett Vale, November 5.

Present—Messrs. L. F. Christie (chair), A. Pocock, G. Goldsmith, J. Depledge, T. Anderson, F. C. Pocock, and J. R. Bain.

EFFECT OF FERTILISERS.—Mr. A. Pocock tabled samples of wheat plants from the same field, one portion having been manured with super, and the rest left untreated. The manured plants were strong and healthy, whilst the others were thin, and 14in. shorter. Mr. J. R. Bain tabled sample of Tuscan wheat, off sandy soil, fallowed, sown broadcast in April, 80lbs. of seed per acre, with 2cwt. Chemical Works' bone super. This gives promise of a splendid return.

WEED.—Mr. Christie tabled *Fumaria officinalis* (identified by Gen. Sec.), an annual, growing usually in damp places, in old times supposed to possess medicinal value, but of no use now.

STALL-FEEDING OF COWS.—Mr. A. C. Pocock said he had found chaffed hay, damped with hot water the day before using, and adding crushed wheat and a little linseed at the same time, is splendid feed for cows, and it is much cheaper than copra cake or bran. A little care is necessary in feeding, otherwise the cows become dainty. He recommended keeping some good Jersey cows with the rest, and have them to come in during March or April. All members agreed in the opinion that much valuable information is being given by the Dairy Instructor (Mr. G. S. Thomson) in the *Journal of Agriculture*.

Golden Grove, October 24.

Present—Messrs. R. Smith (chair), T. G. McPharlin, J. Woodhead, J. Ross, W. Mountstephen, J. Rawlins, J. McEwen, and J. R. Coles (Hon. Sec.).

DAIRYING.—Mr. J. R. Coles gave some of his experiences in feeding dairy cows during the past fifty-four weeks. He had tried different rations, including chaff, bran, and crushed wheat; chaff, pollard, and bran; chaff, copra cake, pollard, and bran; chaff, bran, and flour; and the pollard and bran had been tried both in a wet and a dry condition. He considers the best and the cheapest ration to be chaff, bran, and flour, with a little salt. The ration for each cow would be 11lbs. chaff, 3lbs. bran, 1lb. roller flour, 4ozs. salt per day, to be lessened when there is plenty of herbage. During fifty-four weeks he obtained 2,673½lbs. butter from ten cows, or an average of about 5lbs. 2½ozs. per cow each week all through, which cost 6½d. per pound, without counting labor, and it realised 11½d. per pound average. Members consider that dairying on these lines would best suit a man with a useful family. The cost per pound was rather high, but some of the experimental rations were costly. Referring to the *October Journal* and Mr. Dawkins, of Reeve's Plains, members would like to learn whether his statement that Jerseys will average 10lbs. of butter per week for fifty-two weeks is founded on his own actual experience.

Arthurton, October 24.

Present—Messrs. W. H. Hawke (chair), T. B. Wicks, S. T. Lamshed, J. B. Rowe, W. E. Hawke, L. Crosby, W. Short, T. Baldock, C. L. Palm (Hon. Sec.), and fifteen visitors, including Mr. A. Goodall, of Paskeville Branch.

RAINFALL.—By W. H. Hawke, Tiparra, for year to date, 12.30in. By W. Short, Winulta, 13.11in.

STUBBLE-BURNING.—The Chairman read the following paper:—

Seven Reasons Why Stubble Should Not be Burnt.

In dealing with the subject of stubble-burning I simply state my opinion, at same time admitting that there may be times and conditions when stubble-burning may be judicious, such as a crop that has been badly affected with red rust or some other disease that may be carried on to the following year in the stubble. The following remarks are, I think, applicable to this neighborhood, or to any other where the holdings are fairly large, land cheap, and a good market for stock handy. No doubt there are many other reasons why stubble should not be burnt, but the following seven are all that I can think of at present:—

1. Stubble, if worked into the land, creates humus. Scientific agriculturists—men who have made the composition of the soil, the structure of plants, and the necessary conditions for their successful development a life study—tell us that a soil to be fertile must contain a considerable quantity of humus, this humus being principally composed of decomposed vegetable matter; that if crops are grown this indispensable substance is gradually used up, and if some matter to form more be not added, the land becomes short of it, and will not grow a full crop. The scientific man also tells us that humus renders a sandy soil more retentive of moisture, and a clay soil more absorbent of it. This is very important in a dry area like ours. Now stubble if worked into the land will in time make this valuable and indispensable ingredient of soils, and therefore should not be burnt, but ploughed in at fallow time. I find that if the land be well stocked, when fallow time comes the stubble is broken up into small pieces and offers no impediment to culture when working fallow or drilling.

2. Stubble if left gives better and earlier feed. From my experience this year, when we had a dry and cold winter, I can safely say that the stubble land gave three times as much feed as the land that was out a year, i.e., carried a crop the year before the stubble land; and also that there was picking for sheep in the stubble six weeks or two months earlier. Some of my stubble land has been carrying two sheep per acre for months, and the feed has increased and run away from them.

3. Loss of soil. When stubble is burnt you lose not only all the constituents of the straw, but the top of the soil is calcined and blows away for a considerable depth with the wind. Each succeeding high wind takes away a portion of what is probably the best of the soil and scatters it over the neighborhood, to the loss of fertility of the field and the annoyance of neighbors in the track of the dust.

4. Weeds disseminated. I think it highly probable that the light seeds of weeds are carried along with the dust just referred to and scattered over adjoining fields.

5. Seeds of weeds germinate better if stubble is left, and you will have the land cleaner for next crop.

6. Induces the farmers to put in a second crop. I consider it a mistake to grow two cereal crops in succession in this neighborhood unless the first was a very poor one. The fact that a good crop was grown the preceding year should be, in my opinion, a sound reason why the land should have a rest, or rather a change to pasture. I am a believer in the three years' course as being, as far as our present knowledge and experience goes, the best system of farming applicable to this part of the State. From experiments carried out by Professor Lowrie at Roseworthy, when sulphate of ammonia was used in addition to superphosphate, the gain to the crop was very little, not nearly sufficient to pay for the ammonia used. This seems to prove that our lands contain sufficient of that expensive and necessary ingredient - nitrogen, and probably if the three-course system is carried out, the stock of nitrogen in the soil, with gains from the atmosphere and from decayed vegetable matter, will be sufficient for crop requirements in the future; but if two or more crops are grown in succession, the time may come when the calls on the bank will not be borne in full, and we shall have to supplement the phosphates with a manure whose market value is about three times as high as super.

7. Rainwater not so likely to run to waste. Should a heavy fall of rain occur at the end of autumn or in early winter, if the land is bare a quantity of it would run off into crabholes and other low spots; but if a good coating of straw is on the ground this would be lessened, if not prevented.

TRIAL OF HARVESTERS.—Mr. A. Goodall reported that the Paskeville Branch had secured a wheat crop and had made all arrangements for the trial of wheat-harvesting implements to be holden under the auspices of the combined Northern Yorke's Peninsula Branches. The locality was close to the Paskeville Railway Station, and date of trial would be notified when the crop was in proper condition.

Onetree Hill, October 26.

Present—Messrs. J. Bowman (chair), H. Blackham, F. L. Ifould, M. Smith, A. Thomas, and J. Clucas (Hon. Sec.).

ATTENDANCE.—The Hon. Secretary said the average attendance of members at meetings during the past twelve months had been six.

OFFICERS.—Messrs. Bowman and Clucas were thanked and re-elected Chairman and Hon. Secretary respectively, and Mr. Ifould was elected Vice-chairman.

CHAMPION SHEEP.—Members are pleased that Mr. Thomas took champion prize for his sheep at the late National Show in Adelaide. Other members have also secured enviable honors at the Gawler Show.

CONGRESS.—Messrs. Clucas and Thomas reported on proceedings at Congress. They considered that these annual meetings greatly helped in the dissemination of useful knowledge.

Boothby, October 1.

Present—Messrs. J. A. Fould (chair), J. Bell, R. Chaplin, J. Way, and M. Leonard (Hon. Sec.).

WEEDS.—Mr. T. Sims read a paper, of which the following was the purport:—

Weeds are plants that are not wanted by the cultivator of the soil. Even a plant that would be useful if in its proper place would be a weed when growing where it interferes with a cultivated crop. Thus a cabbage in a wheat crop would be a weed, and wheat plants amongst a bed of cabbages would be weeds. But there are plants that are weeds wherever they may be growing, being either injurious to or not edible by farm stock, or overrunning the land to the exclusion of other useful plants. Charlock, for instance, is a bad weed in a wheat crop, but is useful in a paddock where sheep are grazing, whilst stinkwort is useless in any locality. Against these utterly useless, as well as against the poisonous and injurious weeds, the farmer should wage an incessant warfare. There are large areas of land in the State that are occupied by noxious weeds, and it often happens that a farmer prepares his land, sows his seed, and

ultimately finds that his field is overrun with weeds, to the ruin of his crop. This result is often owing to his neglect to destroy the first specimens of the various weeds, allowing them to produce seeds enough to cover his fields. He ploughs the seeds under, and there they lie dormant for many years, until the implements bring some of them near to the surface, when they spring into growth, whilst multitudes remain buried till brought up in later years. If left out of cultivation for several years the result is the same; directly the buried seeds are brought near enough to the surface they germinate, and the field is as dirty as ever. This shows the necessity to destroy the first weeds that appear, as well as the folly of ploughing under the seeds of certain kinds of plants, such as charlock, mustard, poppy, &c. The stinkwort has not yet got a hold in this district, and if farmers do their duty to themselves and neighbors it will be kept down. Every one should make it his business to destroy the few plants "on sight." Neglect of the sparrows, rabbits, starlings [and foxes.—GEN. SEC.] has foisted upon the occupiers of the soil a most intolerable and unnecessary burden. Do not allow neglect to increase our troubles. Sheep are highly beneficial in keeping down several kinds of weeds.

Mr. Way said cockspur (*Centaurea melitensis*) and dandelion [not "dandelion," but Cape marigold—*Cryptostemma calandulacea*.—GEN. SEC.] are most useful weeds for sheep and cattle feed, although not at all desirable in a wheat crop. Mr. Chaplin considered the most undesirable weed in this district is that known variously as "turnip weed," "charlock," "Spanish radish," "wild mustard," &c.

WORKING FALLOW.—Mr. Foulds strongly condemned the use of the scarifier in working fallowed land, and recommended the paring plough, one working of which is more effective in destruction of weeds than three scarifyings.

POISONING RABBITS.—The Chairman directed attention to the common but most dangerous practice of laying phosphorised pollard baits along the roadsides.

PIG-BREEDING.—Mr. Foulds said he had proved that pig-breeding is a most profitable industry in connection with wheat-growing. He favored letting them run on paddocks sown with barley until fattening time.

Yorke town, November 9.

Present—Messrs. J. Koth (chair), B. Lloyd, A. Domaschensz, A. E. Anderson, A. Jung, J. Latty, and J. Davey (Hon. Sec.).

WHITE HEADS.—Several members mentioned the prevalence of white ears in the wheat crops. The affected plants have but few roots, and they appear to die from the roots upwards.

RED RUST.—Red rust is somewhat common in the wheat crops, but appears to be chiefly confined to the flag, and the early crops are too well advanced to be injured by it. The late crops may possibly suffer if the weather should prove sultry and humid.

STOCK, &c.—The grass paddocks are luxuriant, and live stock are doing well.

Mount Compass, November 7.

Present—Messrs. M. Jacobs (chair), F. Slater, E. C. Good, A. Sweetman, R. Peters, W. Cowling, F. McKinley, B. H. McKinley, R. Cameron, S. Arthur, D. J. Hutton, C. S. Hancock, A. J. Hancock (Hon. Sec.), and one visitor.

SEASONABLE HINTS.—During December plant potatoes, cabbages, cauliflower; sow turnips, swedes, parsnips, celery, peas, and beans.

FIELD POPPY.—Mr. Peters reported finding field poppies in his garden. Mr. F. McKinley urged members to be vigilant in exterminating new weeds, and avoid introducing any fresh pest. He had found seeds of sorrel, nettle, wild geranium, and wireweed in a bag of purchased manure.

BEE-KEEPING.—Master D. D. Hancock (visitor) read the following paper:—

Most boys have hobbies—mine is bees. It is a pleasure to attend to them, and I intend to make a business of pleasure. I started last year by catching a few swarms, and getting some out of trees. My brother gave me a book, "The A B C of Bee-culture," and some friends gave me some information how to set to work. I have all bar-frame hives, as they are easier managed. When I find a swarm I put them in a box with a lid I can lift off, and empty them into or in front of the hive I intend for them. The hives and frames should be ready beforehand, as I lost two strong colonies through keeping them too close in the box while I got the hive ready. I find the best way to get a flying swarm to settle is to shoot up into them with blank cartridge. I have got them to settle when they have been up 30ft. to 40ft. in the air. The hives should be made of good material, so as to keep out the wet; bees do not like the damp, and I find sand a very good thing to put under the hives, as it helps to keep down the damp, and, another thing, you can find out if any mice or other pests are attacking them at night, by their tracks on the sand.

Mr. Slater said he had a swarm of bees under the floor of his new house, and he would like to know how to get them away. They had entered through ventilator holes in the lintel, and he had stopped these up, but now the bees came up between the floor and the wall. The members are desirous to learn more about bees.

Tatiara, October 24.

Present—Messrs. W. E. Fisher (chair), J. Rankine, H. Killmier, F. Smith, P. Low, T. Hall, T. Moten, A. D. Handyside, M.P., C. H. Wiese, and T. Stanton (Hon. Sec.).

OFFICERS.—The Chairman and Hon. Secretary were thanked and re-elected.

ANNUAL REPORT.—The Hon. Secretary reported that the average attendance for the twelve months had been only five. Two new members had been added, making the full membership of fifteen.

BEAN APHIS.—Mr. P. Low said his broad beans had been attacked by the black aphis, but he had used tobacco wash with good results.

Angaston, October 26.

Present—Messrs. F. Thorn (chair), A. Friend, J. H. Heggie, R. Player, A. Salter, P. Radford, S. O. Smith, J. Vaughan, J. E. Swann, W. Sibley, and E. S. Matthews (Hon. Sec.)

AN "ORIGINAL" PAPER.—Mr. J. H. Heggie read the following:—

At our latest meeting we had under discussion "How to make our meetings more interesting," and I proposed a discussion on the monthly number of the *Journal*. My proposal was quashed by Mr. Smith and our Chairman as liable to stifle originality. However, "The proof of the pudding is in the eating thereof," so I trust that what I now offer will contain sufficient originality. Under "Notes and Comments," page 206, you will find the following:—"The only guide to the farmer is experience. Find out what others have done under similar conditions and prove by experiment whether the treatment beneficial in their case is equally so in yours." Could better advice be published in any agricultural journal in the world than the above? Our *Journal* lets us know what others are doing; the proof by experiments rests with ourselves. We must all gain our own experience. On page 216 the Hon. Minister of Agriculture makes the remark, "The value of the experiments lies in this direction. If the experiments that have been tried result in failure it teaches us to avoid the same loss in future." Now do we as a Branch experiment as much as we are able? I do not think so, and I think this remark applies equally to all our Branches. We might do more. I fail to see how our *Journal* can do more for us than it does. There always is and must be a certain amount of information published which does not apply to us personally, but it rests with ourselves according to our judgment and experience to sift (if you will allow me to use the expression) the grain from the chaff. An agricultural journal should be to the agriculturist what I understand the Bible is to the clergyman—his companion. On page 208 you will notice a report of the Phylloxera Board. As our Mr. Smith is a member of this board I propose that in the near future he gives us a paper giving us the fullest information in regard to the working of the

board from its formation, its relation to the Government, the amount of money expended, and the results. This would be an original paper. The address by the Minister of Agriculture is without doubt one of the gems of this *Journal*. It is teeming with information and interest to us all. It is concise and to the point, and it is given in simple plain language. We may well congratulate ourselves that we have at present in this State an agricultural minister who has without doubt the agricultural interests so much at heart. It is stated on page 210 that the Member for the Burra (the Hon. W. B. Rounsevell) has tabled a motion proposing that a certain amount should be placed on the Estimates in order to carry out agricultural experiments. He further adds, on page 217, that he would like to see a committee formed, to consist of members from the Central Bureau and the various Branches, to devise some scheme in order that the money be expended in a way that will be in the largest measure profitable to the community. There is an opportunity for originality, and I would suggest, instead of adopting the suggestion of the Hon. Minister (on page 211) of giving three or four tons of fertilisers to farmers (carriage paid) to experiment with, that the State be divided into the following districts:—

No. 1. The South-East, coming as far north as the Murray mouth.

No. 2. From the Murray mouth to Adelaide; thence to Gawler; from there to Angaston; then going due east until it meets Goyder's line of rainfall, and following that line in a southerly direction to the Murray. This would virtually be the Hills District.

No. 3. From Adelaide north, taking in the plains and embracing the whole of the Lower North.

No. 4. Country outside Goyder's line of rainfall.

That experimental farms be formed in each district. That the farms be formed, not on the best land in each district, but on average land. That the experiments be carried out under the supervision of the Professor of Agriculture.

In the vicinity of Millicent or Penola should be suitable for the South-East; a farm situated near Mount Pleasant would be a fair criterion of the Hills District; Roseworthy College and farm is an experimental farm for the Lower North; the Murray Flats, or somewhere north of Quorn, would suit the outside country. This plan would, I think, give more satisfactory results than a few individual farmers scattered about the State experimenting in an indifferent manner. Enterprising farmers will in any case experiment on their own account.

Now to refer back to page 211. We are told that our farmers are just as far advanced in progressive agriculture as those of any of the other States. This is gratifying, as both Victoria and New South Wales are older States than we are, and in their agricultural districts have a better rainfall. I think we have in a great measure to thank our Agricultural College and late Professor for our position.

On page 217 reference is made to a shipment of wheaten hay to South Africa. It is a mistake to ship hay; it should be chaffed and compressed. Why? Because hay cannot be compressed into the same space as chaff. The hay is more liable to deteriorate in quality from exposure to sunshine and rain, and is of less value as a fodder. Our member, Mr. Smith, exports jam, preserved fruits, and wine. What are jam and preserved fruits? Are they not fruit in a condensed state? What is wine? Is it not the product of the grape condensed? Now this is the point. You all know that vessels charge freight according to space occupied, and you know that a ton of chaff compressed occupies less space than a ton of hay would. Well, now, what do we gain by shipping a product in a condensed state? Principally a saving of freight; also we are able to send our products a long distance by sea and land and place them before the consumer in good condition, and obtain the highest prices for them. What about wheat? Well, wheat is one of the exceptions that proves the rule. Now take wool as another example. How much a year do you think Australia would save in freight by exporting all her wool in a scoured state? I do not know exactly, but it would be a very large amount. Many of our far northern squatters have long since found this out, and they scour the most of the wool on the stations just to save the freight on the camel teams and railways.

Australia, to compete against the other countries in the markets of the world, must ship her products in a condensed form, or rather we must send the very essence of what we produce.

You may ask, "What has wine and wheat and wool to do with shipping hay to South Africa?" All I can reply is that this paper is termed "original."

We are told the War Office ordered hay; well, all I can say is that the Commissariat Department of the War Office have yet a great deal to learn of the best methods of feeding their horses during a campaign. From experience gained on the Western goldfields (where the conditions were very similar to what they are in South Africa to-day, viz., a large number of men and horses far inland who had to be supplied with imported products which had to undergo a long railway journey to a base of supplies, and was then packed on teams, &c., until it reaches its ultimate destination) I assure you that hay cannot be shipped successfully either baled or trussed. Why? Because, as I have already stated, it deteriorates in value from exposure to wind and weather, and if you will turn to page 269 you will see that the Editor bears me out in this. He says, "Exposure of the hay to rain, dew, heat, and light causes a loss of sugar gum, starch, oil, and aroma, and the remainder is therefore deficient of nourishment to the extent of that loss."

Now when hay is shipped in the form of chaff in ordinary bags it does not lose much in nutritious value; but it does in weight or money value, for this reason, that every time it is loaded or unloaded bags are torn and chaff is lost. And just here I should like to say that I do not think the average Australian stevedore has anything to learn from any foreigner of the art of knocking cargo about on a wharf. Hay can be shipped most successfully when it is chaffed and the chaff compressed by hydraulic pressure. It is then in small oblong blocks weighing about 50lbs. or 60lbs., and is covered with bagging. In this manner it does not lose any of its nutritious value, it does not lose in weight or money value, and it is the most convenient form in which it can be handled.

Also, on page 217, is the following remark by the Hon. Minister:—"That hay is a great deal too ripe." Hay, when it is to be used in the form of chaff (as it should be when fed to horses) cannot be too ripe. I believe that the agriculturists in South Australia who favor green chaff for horse-feed far outnumber those who advocate straw-colored chaff with grain in it. For many years I also was a believer in green chaff as being the best, but I have changed over to the other side, and now I know that straw-colored chaff with good grain in it is best. The better the grain the more nutritious the chaff. I have tried both. When chaff was from £16 to £20 per ton on the fields it cost to keep horses some £3 per head per week, and I have paid for my experience. If you will turn to page 269 you will see that the Editor again bears me out. He says, "Hay is in its best and most nutritious condition when the grain is in the soft dough, but the color is not attractive to the human eye, and there arises a suspicion of 'straw' when the green is not prominent."

I should very much like to see the following experiment carried out at the College:—

- a. Ten acres of wheat to be cut for hay as green as it is possible to cut it
- b. Ten acres of wheat cut for hay, so that the grain would be only half developed when turned into hay.
- c. Ten acres of wheat cut when ripe, or the grain thoroughly matured when turned into hay. The three lots at the time of cutting the green hay to be as equal as possible. The whole three lots of hay to be chaffed separately and fed to three horses each doing the same amount of work and as nearly as possible in the same condition. Each horse to be fed on one kind of chaff only, but all three horses to receive the same amount by weight daily. The horses to be weighed weekly, the condition noted, and the result published.

The Western Australian farmer cuts his hay at a far more advanced stage than is done in South Australia. On inquiry among these farmers I was told that by so doing they obtained a greater weight per acre than when cutting it green.

Meadows, November 4.

Present—Messrs. W. Pearson (chair), T. B. Brooks, G. Ellis, W. Vickery, T. W. Dohnt, W. Nicolle, D. D. Murphy (Hon. Sec.), and one visitor.

BEES.—A paper on "Bees," by Mr. E. F. Stevens, was read by the Hon. Secretary as follows:—

"The beekeeper surely is born and not made." To be a successful apiarist the beekeeper must have a strong liking for that particular occupation, and when the liking is acquired and a certain amount of knowledge as well, it is not easy to shake it off, even when having to contend with adverse circumstances. Whilst going through the mill of experience the more anyone learns the deeper is he engrossed and the more to learn. With the aid of books and personal experience (which is the best schoolmaster), by adopting the latest methods and using the most modern appliances in the manipulating of bees, together with a favored district, it is surprising the large quantities of honey that can be produced compared with the old style of box hives. The question which troubles the average beekeeper is how to dispose profitably of his produce, for like many other things, it is an easier matter to get produce for the market than a market for the produce. From publications received lately I am led to believe that there is an open market beyond the sea, and if there were a bonus per ton on all honey exported it would foster an export trade, and beekeepers should form an association and export a uniform quality in large packages. It has been said that Australian honey tastes of eucalyptus, but several people who have had the opportunity to judge between Australian and Californian honeys, have failed to detect any difference, and yet Californian honey realises a high price compared with ours. England receives over £5,000 worth of honey every month, mostly from countries not her own possessions. When Imperial federation is a practical fact, Australian honey should be taken instead of Californian.

"Who should keep bees?" is a question often asked. Although everyone should produce all they can on a farm to assist the source of income, I think it unwise to lay out money in bees or appliances unless one of the family is willing to make it a hobby, and even then it will depend on the district as to whether it will pay or not. Bees will thrive at certain times

of the year almost anywhere, even in the city, but there are districts where bees, with attention, can be kept with great profit. Beekeeping on plain land, or away from heavy timber, should not be attempted with a view to profit. An apiary in a suitable district will yield as high an average per hive as any other country. We must not, however, run away with the idea that timber is the most essential item; there are two things more necessary than that on which the success depends, that is the apiarist's thorough knowledge of management and the kind of bees he keeps. Anyone contemplating beekeeping should not fail to get Italian queens, which can be bought for a small figure, and will pay for themselves in a very short time. The Italians combine so many excellent traits with so few faults, have deserved pre-eminence over all other races, and this pre-eminence has been held ever since their introduction into these States. Care must be taken before breeding from imported Italian stock to ascertain whether they are of a honey-gathering strain. This can be done by keeping the queen over the first year, and if her progeny are good honey gatherers, then breed a number of young queens from her the next season, and thus, when an apiary is established, always breed from the colony which gives you the best yields, irrespective of color; but my experience is this—keep the color and you have the honey gatherers—that is if the care and precaution before mentioned is taken. The object now in the bee world is to breed queens of a long-tongued strain, thus being able to gather honey from deep flowers that otherwise would not be gathered. The way to determine which has the longest tongue is this; the bees have to suck syrup or stiff candy through a wire mesh, and the colony that can reach the greatest distance proves their length of tongue; but if we breed from those that give the best yield, we have the long-tongued strain. The Italian also is an enemy to the wax-moth, whereas the moth is an enemy to the common black bees and the reason of so many losses. The egg-laying capacity of the Italian queen is much stronger than that of the others, and hence more workers for the field. They are practically non-swarmers, and an old queen will very often allow a young queen to be laying in the same hive. There are times when a beekeeper has to be a beekeeper in earnest and in a practical way, but a little sugar and care at times will tide them over the worst, and they will pay well for it in the end. Some advocate feeding as a stimulation, but I do not believe it to be a wise thing unless the honey is expected to come on suddenly. I believe in feeding only with the view of keeping bees alive. It has been said that an amateur beekeeper is a man who keeps bees, not for what he can make out of it, but with the view of advancing science, neither making or seeking to make profit out of them. Cleanliness is an essential in bee management. This can be best secured by bar-frame hives and by scrupulous attention to the purity of color, flavor, and general appearance of all honey sent to market. Anyone keeping bees should not leave small pieces of comb and honey lying about, as this puts bees off their work and starts robbing and quarrelling. Where there is only one hive and no neighbor keeps bees the case is different; but even then no pieces of comb or honey should be left for the bees to get at. Bees ascend with difficulty when heavily laden, and on this account the apiary should be located in a valley or low ground rather than on a hill, that they may rise as they go in quest of stores and then have the downward slope as they come in with their loads. They will suffer less from the effects of heavy winds when located on rather low ground. Some people who rush headlong into the industry with little knowledge as to management are like seed sown on stony places—it immediately springs up; but when low prices arise, which are not in time to save him, and which comes only perhaps one in ten years, and a visitation of foul brood (which is much more frequent), likewise the moth that hovers around him every day waiting to destroy, at last he is offended and suddenly vanishes from existence in the bee world with blasted hopes and appliances for sale cheap. Therefore expect failures; profit by them, and if beekeeping is brought to a successful issue it will be the outcome of patience and perseverance.

Millicent, November 7.

Present—Messrs. H. F. L. Holzgreffe (chair), H. Hart, S. J. Stuckey, H. A. Stewart, H. Warland, J. Davidson, L. Oberlander, and R. Campbell.

SULPHURIC ACID.—Mr. R. Campbell said the Wallaroo Smelting Company could manufacture 20,000 tons of sulphuric acid annually, and if phosphatic rock could be discovered, the mineral super. could be produced in large quantities.

ARTIFICIAL CALF-FEEDERS.—The Hon. Secretary wrote, stating that he was much satisfied with a Clarke's calf-feeder that he was using.

LABOR-SAVING METHODS.—The Chairman described an idea commonly adopted in Victoria to prevent belts slipping on machines, which also considerably reduces the loss of power. For a stripper, drill eight holes in the beater pinion, and fix a piece of leather on the circumference with copper rivets; on the driving wheel wind spirally, about 2in. apart, either hay tie or the bale

lashing of binder twine, beginning and ending at a spoke where it can be fastened. This saves all the mess, bother, and cost of treacle, oil, resin, &c., and is fully a horse-power lighter than the latter. Mr. Hart said the leather can be laced on the pinion if it is cut a $\frac{1}{2}$ in. less than the circumference of the pinion. For heavy driving, if the belt slips, it is a good plan to hang a second belt over the other. It is better than riveting two belts together, as is sometimes done, and no harm is done to either. Mr. Holzgreffe expressed surprise that the circular saw is not more used for cutting firewood. Another member said the easiest way to cut firewood is to make the boys do it. ["How to make farm life attractive to the young folk?"—GEN. SEC.] Several members described windmills of various designs that are used for driving saws, chaff-cutters, &c. Messrs. Campbell and Hart spoke of the great usefulness of the vice and a good set of taps and dies, but condemned cheap tools of any sort.

ENSILAGE.—The Chairman mentioned the general neglect of ensilage, and raised the question whether it is as good a thing as it was once supposed to be. He had noticed that the pits at Roseworthy College were always empty when he visited there; but a member remarked, that at the time of the annual farmers' visits the time for making silage had not arrived, and for several years past the seasons had been droughty, so that heavy calls have been made on the food resources of the college as well as elsewhere. The Chairman said a few farmers in this district had made silage once, but had abandoned the practice. Mr. Stuckey said a deal of grass was allowed to go to waste, whereas it would have been valuable if cut for hay and stacked. Mr. Stewart said Messrs. Hensley, at Rendelsham, were making silage this season. [Too many farmers do not like the trouble of ensiling fodder; and many dairymen have found that a little bran, and some oilcake, and a little of something in addition to silage is as necessary for cows as when the animals are grazed on ordinary grass pastures. Because silage does not fill the whole bill as cow-feed many farmers condemn it, but that is a great mistake.—GEN. SEC.]

MANURING POTATOES.—Mr. R. Campbell quoted experiments made in 1883 in manuring potatoes. A complete fertiliser was used at the rate of 8cwts. per acre. Following are the results:—No. 1, sown under the sets and covered with a thin layer of earth on which the sets were laid and covered, yield 6 tons per acre. No. 2, manure mixed with soil immediately beneath each set, yield 7 tons 16 $\frac{1}{2}$ cwts. No. 3, manure broadcasted on the surface at time of planting, yield 11 tons 1 $\frac{1}{2}$ cwts. No. 4, manure broadcasted on the surface and slightly stirred with the fork (equivalent to a light harrowing), yield 13 tons 5 $\frac{1}{2}$ cwts. No. 5, the rest of the field, broadcasted with the manure, as on No. 3, gave a yield of over 11 tons per acre. Mr. Davidson said that in New Zealand the manure is broadcasted on the surface and the land ploughed and rolled. The furrow is then opened with a moulder and the potatoes planted therein, and the ridge split back on them. He believed this was the method practised in England and Scotland. Mr. Stuckey said he had heard of good crops where only straw was put in the furrows with the sets. He had had best crops from turf land where most grass was. He thought the best plan was to put in the manure with a green crop and feed off and plant potatoes following. The Chairman said he had used fresh farm manure and it made the skins rough. He believed that Messrs. Davis, of Mount Gambier, broadcasted the manure over the grass land and planted. Mr. Hart said the idea of putting the manure near to the seed was exploded. He believed in broadcasted manures—the roots would soon find it. To improve a piece of sandy land he would fertilise and grow all he could on it and plough it in. This would put plenty of humus in the soil, which sandy soil lacked.

SEEDLINGS IN BOXES.—Mr. Hart said the effect of a sheet of whitewashed glass placed a foot above seedlings raised in boxes is wonderful.

CLEAN RAIN-WATER.—Mr. Holzgreffe showed a contrivance for preventing rubbish flowing into the rain-water tank. It consisted of a long box, say 2ft. by 1ft. wide and 1ft. deep, with bottom of perforated zinc, or wire netting with $\frac{3}{4}$ in. meshes; another box beneath nearly the same size had perforations $\frac{1}{4}$ in. meshes, and the clean water then flows into a receptacle into which the head of the downpipe is soldered, the entrance to which is covered with perforated zinc.

Cherry Gardens, November 12.

Present—Messrs. C. Lewis (chair), J. Lewis, T. Jacobs, H. Strange, W. B. Burpee, G. Brumby, J. Potter, G. Hicks, and C. Ricks (Hon. Sec.).

CODLIN MOTH PARASITE.—The Hon. Secretary tabled correspondence from the Biologist to the New Zealand Department of Agriculture in reference to the parasite alleged to be keeping the codlin moth under control in Otago. It appears that in one garden a minute fly, which lays its eggs on the egg of the codlin moth, was discovered by one of the fruit experts attached to the Department of Agriculture. This fly has been identified as one of the parasites known in America for some years. It appears to have a very marked effect in checking the ravages of the codlin moth caterpillar, but up to the present it has only been found in the one orchard in New Zealand, and although, so far, it appears to promise well, the New Zealand authorities are of opinion that no general opinion for or against it can be drawn. Many parasites have proved so disappointing that it would be unwise to rely too implicitly upon the natural enemies of the codlin moth, or to attach too much importance to the work of this one until careful investigation and the work of another year has shown it to be of definite value.

EXHIBITS.—Mr. Burpee tabled some good specimens of White Elephant potatoes grown on the school plots. Mr. Potter showed samples of wheat, one plant consisting of 112 stalks. These were grown on what is considered to be poor land, but was manured with 56lbs. of super. per acre. He expects to cut 3 tons of hay per acre.

BRANCH SHOW.—An executive committee of three was appointed to make necessary arrangements for Branch show to be held on Thursday, March 20.

Naracoorte, November 9.

Present—Messrs. Schinckel (chair), H. Buck, W. C. Hastings, Job Wynes, E. Thomas, and H. Hassler.

AGRICULTURAL PLOTS.—Members inspected the agricultural plots connected with the agronomy classes of the State school. Mr. Hassler being the teacher. The plots comprise fruits, vegetables, cereals, and fodder plants, in separate blocks. The fruit trees and vines were very healthy, but some of the vegetables and fodders were put in too early or too late respectively. The cereal plots were instructive, as showing results of various manures. Everything was labelled, and many also furnished particulars as to date of sowing and treatment. There is no provision for watering, which is a defect as regards cultivation of all vegetables, and some fruits. In discussion, Mr. Buck said he had noticed "takeall" and smut in some of the plots of wheat. He thought potatoes had been planted too late. Mr. Wynes said some of the cereals and vegetables had been put in too late. Some of the wheat plots were sown too thickly. There was a marked difference in the plots sown on fertilised soil. Mr. Hastings considered the land unsuitable for the educational work. The Chairman said the plots were a credit to the teacher and the students. The

potatoes should have been planted about the end of July or beginning of August. The sparrows would negative any successful test of wheat crops. The fruit trees ought to have done better, and October was too late for planting them. Pruning had been done to excess, in the endeavor to let the students see the methods in detail. Kale was planted too thickly to allow of horse-hoeing between the rows. Maize looked promising, but required a certain amount of manure. He considered the land just right for experimental work, for if wheat and other plants could be grown on poor land they would do better on richer soils. Mr. Thomas understood that the object of agricultural teaching in schools was to imbue children with a love of agromonomical pursuits. If the land were selected because of its unsuitable nature, it was a mistake. Both children and teachers were learners, and if they succeeded in growing crops of any kind on really suitable land they were doing good work. It was difficult enough for experienced men to conduct experimental work, and such work should not be left to children. The block just inspected was unsuitable land. Mr. Hassler admitted that he had much to learn, but it was only by experience that one could gain knowledge. He had yet to become acquainted with the climate and other conditions of the district. He could not superintend every detail in the work on the plots, but no blame for errors as to times of sowing or planting, or of the methods of treatment could be laid on the students, who did a deal of work in keeping down weeds, and who had worked splendidly.

Tanunda, October 25.

Present—Messrs. J. H. Walden (chair), C. W. F. Lehmann, W. Liddiard, P. Trimmer, and C. Heinemann (Hon. Sec.).

BEST VINEYARDS.—Decided that this Branch will continue, as before, to have a competition next year to decide who can show the best cultivated vineyard. It had been proposed that Angaston and Lyndoch districts should be invited to take a part in this, but both those districts failed to co-operate.

VERJUICE.—Mr. P. Trimmer tabled samples of vinegar (verjuice) made from waste apples; one sample was two years old and the other six months.

VITICULTURE.—Mr. W. Liddiard read a paper to the following effect:—

The first care in planting a vineyard is to get the kind of vines that are suitable to the soil. There have been many mistakes in this respect, for in the older gardens the shy and delicate vines have been planted on the poorest land, whereas the hardier kinds would have given good returns off that same soil.

Early ploughing is desirable for these reasons:—Firstly, because in this country it is very seldom that we get too much rain, so we must take care of what we do get, and by ploughing in June and July, to give the subsoil a chance to be thoroughly soaked; secondly, we can get the vines cleaned well around. I would rather see a strip of land not touched up the middle of the row than have the weeds growing close up to the vines.

The early ploughing to the vines is what a fallow is to a cornfield, for it has been proved the atmosphere has as much to do with the growth as the soil; and I can say this with safety that the people of this district do not get the returns they would if the cultivation was better.

Then comes the later ploughing, in September. A good many people run away with the idea that it costs so much more, but that is not so. It may cost a little more, but it will pay, especially in a dry season, by throwing the soil back on to the stems. It acts as a sort of mulch, and helps to retain the moisture. We want the moisture late in the season, not in the winter, as the vines are dormant then.

If it were possible I would do away with the scarifier altogether and plough even a third time. The scarifier certainly loosens the top of the soil; but against that it makes a floor under the share (especially the wide shares) almost as hard as cement. We have to use the scarifier, because the vines get so large that we could not get near them with a plough.

Now, it is the general opinion that to manure vineyards costs a lot. Well, it does cost something, certainly. One ton of bonedust each year sown on ten acres—that is 2cwt. per acre. The cost of manure would be £5; labor for sowing same, £1; total, £6. Bonedust

will last three years, so that in the course of three years he will get once over thirty acres of vineyard. To cover that expense he only needs to get 6 tons of grapes extra during all that time, so there is little doubt about it paying.

A good many are starting to trellis the better kinds of grape, and this will pay handsomely. The trouble in trellising old vines is to get them in shape after square pruning, but it can be done if care is taken in the pruning, so that there need be no loss of crops.

One wire is quite sufficient, except in a piece of very strong soil, and even there I would not advocate *Silvoz* cordon, but simply two wires one above the other.

In conclusion, I would say that during the last two years there has been a decided change for the better in the cultivation of the vineyards of the district.

SOURCES.—Mr. C. W. F. Lehmann read a paper on this subject to the following effect :—

On light sandy soils of a fine nature which are liable to blow away if disturbed during the prevalence of strong winds between November till January, the land should be ploughed with a skim coulter on to a depth of 3½ in. as soon as the weeds are well up. This, however, depends upon first rains. Should fresh growth start scarify to prevent young bulbs forming. The land should be well manured with stable dung or bonedust from the end of August till middle of September, then roll and plough 7 in. deep. If the land is dry harrow once, but if it is too light scarify only. It will not blow away, as there are 3½ in. of heavy soil on the surface. In October summer fodder may be sown and will yield good crops, to be followed with wheat or hay, and then left for pasturage for one year. On heavy soils, as soon as the weeds are up, plough deeply and work thoroughly. It cannot be thoroughly worked the second time, but can only be ploughed shallow or scarified to keep it clean. This land will also grow good summer fodder.

Pyap, November 13.

Present—Messrs. C. B. Billett (chair), B. T. H. Cox, J. Bowes, C. H. Mills, A. J. Brocklehurst, A. Westbrook, J. H. McGough, G. Napier, jun., J. Napier, and W. G. Rodgers (Hon. Sec.).

FALLOWING.—Mr. Axon said fallowing is beneficial to soil and crops. Mr. Brocklehurst said the broken soil preserves moisture, and fallowing enables the farmer to destroy weeds, leaving the land clean for crops. Wheat on fallowed land in this district was now 4 ft. high, and quite green, while that on unfallowed land is only 2 ft. high, and is dry. Mr. Reeves advised keeping the teams at work after seeding is finished in laying up fallow, and then scarify in summer to destroy weeds. Mr. McGough advised shallow fallowing especially for killing wild oats, beginning after the first rains. Most members favor fallowing the land whilst it is wet.

THAT BUCKET CHURN.—Hon. Secretary considered that the Gen. Secretary had overlooked the main objection to the bar of wood at the bottom, viz., cleanliness. If the wood were so fitted in that it would be unlikely to turn, it would be difficult to remove for being cleaned, and would probably be left in, and the cream, &c., would lodge about it, and give rise to all sorts of injurious organisms, particularly in hot weather. He thought anyone likely to require so simple a churn would surely own a soldering iron, some solder, and the requisite acid, or could obtain them. A short piece of iron with a hole in it, freed from rust, could be easily tinned by immersing it in the acid bath for a minute or two, and then dipping it in molten solder; and when cold it could easily be soldered to the bottom of the bucket. The less wood about such a churn the better.

APRICOT TREES.—Mr. Brocklehurst said his remarks about flower-buds changing into leaf-buds had not been correctly reported in November *Journal*. What he did say was that this year spurs carrying fruit-buds were covered with blossom, but the buds have turned to wood-buds. In one instance a spur about 12 in. long was covered with blossom, but only set two fruits near the extreme end, the rest turning to wood-buds. Young fruits drop if the spur is touched and leaf-buds appear. He had asked an acknowledged authority about the matter, but he knew nothing about it. The trees were watered in February

after the fruits were gathered, and again early in September, the rainfall in the interval being 5·07in. He was of opinion that the trees should have been watered while the fruit-buds were full, and that watering in August would have averted the trouble. Most of the trees were worked on apricot stocks, and a few on almonds, the varieties being Moorpark and Manchester Seedling (?). The soil is a sandy loam with limestone subsoil in parts. One orchard of eleven acres was ploughed in August, and another of four acres left unploughed, but the result in each case was the same: the greater part of the fruit-buds had turned to wood. [This matter was referred to Mr. Quinn, who expresses the opinion that Mr. Brocklehurst has imperfectly observed what has actually taken place. It is impossible for the fruit-buds to have changed into wood-buds, but what probably has occurred is that the flower-buds have fallen from some cause, and the wood-buds at their base, which would otherwise have remained dormant, have grown. It is not possible to say why the flower-buds have fallen without a thorough knowledge of the local conditions of soil and climate, and the behavior of the trees under ordinary conditions. In some cases watering in the autumn may prolong the growth too long, with the result that the buds do not properly mature before winter, and in the spring they fall.—GEN. SEC.]

EXHIBITS.—Mr. Cox tabled turnip with taproot 3ft. in length, and Mr. Westbrook showed plant of Early Para wheat with seventy-one heads; this was grown on an ashy patch which was cleared last year.

BLIGHTED WHEAT.—Mr. McGough had noticed patches of wheat-growing near pine trees which had blighted and had no grain in the heads; other plants nearer to the trees were quite healthy.

Clarendon, November 11.

Present—Messrs. A. Harper (chair), J. Wright, J. Piggott, J. Juers, A. A. Harper, J. Spencer, and A. L. Morphett (Hon. Sec.).

DIPPING OF SHEEP.—Some discussion on this question took place. Two members took exception to the action of the Inspector of Stock in ordering them to dip all their sheep, in one case because he found one only infested with ticks, and in the other case without even examining the sheep. Mr. Wright thought it paid to dip, irrespective of whether the sheep were infested or not; it improved the wool and acted as a preventive of the spread of tick. It was decided to obtain further information on the matter, and discuss the action of the inspector at the next meeting.

"WILD ONION."—Difference of opinion existed as to whether the weed known as the "wild onion" (*Asphodelus*) was poisonous or not. Mr. A. A. Harper had lost one of his sheep, and believed it was from eating this weed. Mr. Wright had noticed several patches of the weed in the district, and as inspector for the local council he would take means to have them dealt with. Members would like the General Secretary's opinion on the poisonous nature of the weed. [Doubtful. The plant was reputed to be poisonous, and has undoubtedly caused loss at times in other parts, yet the fact remains that while it is very prevalent in the Southern districts we never have complaints of any losses of stock. It is also generally observed that grazing land as a rule keeps fairly clean, showing that stock do eat it at times.—GEN. SEC.] Mr. Spencer pointed out that the red poppy was beginning to spread in this district, and urged members to do all in their power to eradicate it, as it would otherwise become a serious trouble in their crops.

EXHIBITS.—Mr. A. A. Harper tabled some very fine loquats; also sample of Bluey wheat, grown on very poor land manured with mineral super.; the wheat was 4ft. in height.

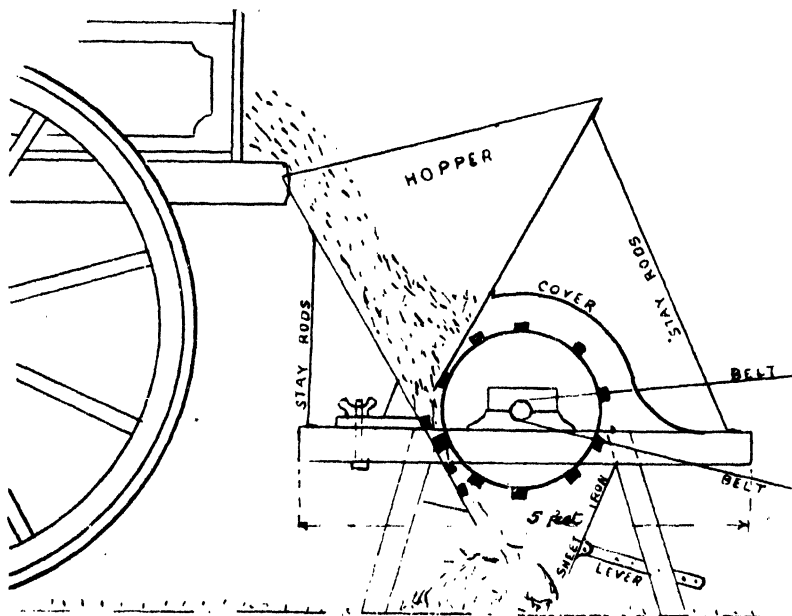
Mount Remarkable, October 24.

Present—Messrs. C. E. Jorgensen (chair), T. Yates, W. Lange, T. H. Casley, G. Yates, H. Humphris, J. B. Morrell, A. S. Marshall, W. Morgan, W. Foot, and J. O'Connell (Hon. Sec.).

MR. LANGE'S EXPERIMENTS.—October *Journal* report was not quite correct. On plot No. 1 the manure was not broadcasted, but was drilled in two months before seeding. The seed was sown broadcast on May 2. Four members reported having visited Mr. Lange's plots on October 23. Plot No. 1 was partly a failure. The other plots were looking well, especially No. 4, fertilised with $1\frac{1}{2}$ cwt. super. per acre, which appeared as if it would well repay for the extra manure. There was very little difference in the plots manured with Thomas phosphate and superphosphate, for although the super. plots appeared to do best at first, the others seemed to overtake them later on.

WHEAT-HEAD THRASHER.—Mr. T. H. Casley read the following:—

Last harvest it was a very common thing in this district to see very large heaps of wheat heads. I believe it was to some extent due to the rain that fell before reaping was completed. At any rate, in my case, I thought, and still think that wheat heads should be properly thrashed and cleaned, and to obviate the old and dirty system of walking round a team of horses or bullocks on the bare ground, I determined to make a machine to thrash them properly, and this I did—to my satisfaction.



The machine was built on economic lines. First, the frame is of $4\frac{1}{2}$ in. x $2\frac{1}{2}$ in. hard wood; the drum is a ten-gallon oil drum, with ten beaters bolted on to the end flanges of drum outside of ends; the spindle is 1 in. square iron, rounded for the bearings—wood—and keyed securely to drum; the face edge of beaters is shod with iron screwed on; the under section of drum—that is, from the mouth side of drum—has four fixed beaters on a frame that can be fixed close up or drawn back to any desired gauge by a bolt in a slotted hole; the drum is protected by a stout galvanized cover, which fits over completely; the hopper, as shown in sketch, is made to fit the end of an English wagon, so that the heads can be forked into the machine with one handling; the driving pulley is 4 in., which is driven by horse-works, so that the speed is very great, the intermediate wheel of works being 3 ft. in diameter, and one horse works it easily. I think, to any handy man, I have given all that is necessary in shape of

information in the building of one of these useful farmer's helps. I have been told by some farmers that such an article is not required, but I prefer my wheat heads properly thrashed, cleaned, and bagged, and defy any man to tell me which is the thrashed heads or which is not; in fact, for seed I very much prefer the thrashed, because the wheat is cleaner, and no broken grain. One handling does, for you have only to fill up the wagon and take to the horse-works; the chaff-cutter belt will do, as you can turn the machine to suit the drive. The winnower should be close by, and then it will be seen where the utility of the machine comes in, for it will take two good men all their time to keep the thrasher clear to put the wheat through the winnower. The side furthest from the winnower should be enclosed, also the end furthest from the drum, or the wheat will be thrown too far. The backbones and chaff should be burnt, as they are very dangerous to stock. The machine can be made for £3.

Mallala, November 11.

Present—Messrs. G. W. Bischof (chair), J. Jenkins, J. McCabe, T. Nevin, J. Churches, A. F. Wilson, M. H. East, J. Nairn, H. B. Moody, W. Temby, F. W. Worden, and W. R. Stephenson (Hon. Sec.).

"THE FARMER AS A STUDENT."—Mr. T. Nevin read a lengthy paper to the following effect:—

No member of the Branch should be a drone, therefore the present paper was prepared. Although the subject does not touch the material interests of the farmers it does indirectly contribute largely to his happiness and worth. Mental culture, unfortunately, is too often overlooked; but future conditions will compel due consideration to its necessity. Old practices in agriculture are being swept away, and new and improved methods are being adopted. To acquire the necessary knowledge, most of the farmer's leisure time must be devoted to close study of the principles underlying and accompanying those new practices. The suggestion of a circulating library in connection with the Agricultural Bureau is a good one, and the agromonomical books of which such a library would naturally consist would be most useful in the pursuit of such studies. The student would have to attack the elementary portions first, and gradually work onwards to the most advanced works, and thus finally make himself master of the laws connected with the science. Agricultural Bureau meetings and agricultural journals may do good work in this direction, but unless a systematic course of study is undertaken in the manner outlined, no farmer can say he has made the most judicious use of the opportunities that are available. The mind of man is capable of indefinite expansion, and with the stimulus of utility such a course of study would be the greatest advantage to the farmer, whose daily muscular exercise in the open air would stimulate the activity of his brain during the leisure of the evening. The farmer who has developed his mental powers by suitable study is the best able to do his work intelligently, and to grapple with the problems which he will necessarily meet with in the prosecution of his work. It is said "An ounce of practice is worth a ton of theory," but it is often true that "A grain of common sense often saves tons of labor." There is great need that farmers should acquaint themselves with the theory of agriculture to a greater extent than is usual. The discussion on Mr. Snell's paper, "Plant Life," read at the late Congress of the Bureau in Adelaide illustrates the absence in some of the speakers of a knowledge of some of the fundamental principles governing healthy plant life. The leisure hours, however, should be to some extent occupied with a course of general literature. Magazines of a scientific nature would have special interest and value. "Scientific Siftings" is a cheap, instructive, and most interesting weekly publication, that should be read with delight and profit by all. Study and thought need not be confined to the evening hours, but may be profitably enjoyed whilst at work in the field—continuing, perhaps, the subject which last engaged the attention at home. There is no end to his opportunities for observing and studying nature in every aspect and under all conditions in the field—the birds, insects, plants, and everything that surrounds him, afford objects for close observation and careful study, and all that he learns about each and every one of them will be interesting and valuable to him. Many Branches of the Bureau are anxious to formulate programmes that will be of greater interest to, and secure more recognition from, the farming community. This can only be brought about by the personality of the members themselves. Given members of a high standard of mental equipment and practical ability, the programme cannot fail to be successful. The chief bane of all such organisations is the limited number of capable members. To write a paper, give an address, or to criticise, requires more than a practical acquaintance with the subject. An educated mind is infinitely more capable of dealing with the task. Farmers, as a class, are quite as intelligent as any other, but their opportunities are so specially favorable for mental culture that it is the duty of one and all to give it serious attention. They are naturally anxious to cultivate their land in a rational way, to produce the best results, and in order to do this they must cultivate the intellect.

Crystal Brook, October 26.

Present—Messrs. J. C. Symons (chair), G. Davidson, W. Natt, W. J. Venning, J. Dabinett, A. Hamlyn, F. E. Fischer, P. Pavy, W. Hamlyn, and F. S. Keen (Hon. Sec.).

CONGRESS.—Mr. Symons reported at length on proceedings of the Annual Congress.

Kapunda, November 16.

Present—Messrs. W. M. Shannon (chair), G. Teagle, J. H. Pascoe, H. T. Morris, W. Flavel, G. Harris (Hon. Sec.), and one visitor.

CONGRESS.—Messrs. Teagle and Flavel reported on proceedings of the Annual Congress, and commended the practical nature of the papers that were read.

TREES AND HEDGES.—Mr. Teagle read a paper on "Tree and Hedge Planting":—

In support of the paper I read at the previous meeting I wish to point out a few of the benefits of tree and hedge planting, as some few people are inclined to condemn the same by saying they are harbors for sparrows. I ask—Is not the sparrow a house bird, and seldom nests in hedges or trees if they have any houses about or buildings of any kind to nest in? A good hedge is much required for shelter of ewes and young lambs and other stock in cold weather. Trees, on the other hand, are a summer shade, acceptable by man and beast, and go a long way to beautify the country, and I read some time ago that some farmers went to the United States and took up land in the Great Platte Valley, in Nebraska, and finding the rainfall was only 6in. and 7in., some of them started and planted 12,000 and 14,000 trees each year. The rainfall increased to 16in. and 17in. in the twelve months after the trees had been planted a few years. The Khedive of Egypt planted millions of trees on the Nile Delta, and after a considerable growth of the trees, the rainfall increased from four days to forty days during the season. All such knowledge as this proves that tree-planting is necessary in this State, as in most years the rainfall is too small. Again, will not the timber pay to the State 10,000 times more than the cost for the destruction of the sparrows? Some few years ago the members of the Bureau at Morphett Vale asked the members of the district council of that place to offer the following rates.—For old birds, 5s. per 100; for young birds, 2s. 6d. per 100; and 1s. per 100 for eggs. On account of the scarcity of the birds they gave 6s. last year, and this season the ravages of the birds have been much lessened. If all the district councils and corporations throughout this State paid such prices as above, it will be only a few years when the sparrows will be exterminated.

Hawker, November 21.

Present—Messrs. H. M. Borgas (chair), J. W. Schuppan, F. C. Hirsch, J. Moller, S. Bowden, J. Smith (Hon. Sec.), and one visitor.

HORSE COMPLAINT.—Mr. Hirsch reported on treatment of horses suffering from some complaint. Although apparently in good condition, they could do no work, their droppings were hard, and he could not get anything to act on the bowels, although he had tried all the usual remedies. The animals were fed on hay chaff mixed with bran, soaked wheat and pollard. Giving green food and bran mashes had no effect. When they got down they could not rise, but when helped up they appeared all right. They had no symptoms of cold, and on opening one that died the organs appeared quite healthy. He got the Inspector of Stock to examine the animals, and he recommended to continue treatment previously given, but not to use fomentations or to work the horses. He followed this advice for some time, but no improvement being manifest, he placed fresh sheepskins across the loins, and covered them with damp bags, and then gave the horses moderate exercise. The skins and bags were left on for three days, the bags were then removed, and two days later the skins were taken off and the animals well rugged. This covering was removed gradually, and in eight days the horses were quite well. The Chairman thought the horses were injured by eating the poppy weed, which was plentiful this year, having

been introduced with chaff from the South last year. He believed it was injurious to stock, and contained opium. He would like the General Secretary's opinion on this point. [The weed belongs to a dangerous family; it exists throughout the Lower North and South, in the wheat fields, but no complaints have been made of its having injured stock. It may be that stock refuse to touch it, but some must be cut with the hay and chaffed.—GEN. SEC.]

CO-OPERATION.—The Chairman referred to paper read at Scales Bay Branch in September. He pointed out that we already had a Farmers' Co-operative Society, and recommended all farmers to join it. It was already a success, and, if supported by the farmers throughout the State, the society could handle all their produce and purchase supplies to the best advantage.

WHEAT-CLEANING.—The Hon. Secretary read a paper on this subject, as follows:—

Much has been said and written on this subject, but, judging from the opinions of those who ought to know, we have not yet attained the desired object. Every farmer should, and doubtless does, know how to clean his wheat, and I think the trouble lies, not in want of knowledge, but in trying to get it done as cheaply as possible. The trouble of dirty wheat is, in fact, due to too much haste in the work. No doubt the low price of wheat has a lot to do with the desire to have the cleaning done as cheaply as possible; but slovenly cleaning means a still lower price, as we have to submit to docking. That we get a lower price in the foreign markets for our wheat because it is not cleaned properly I do not believe, for we present as clean a sample as ever we did. Our F.A.Q. wheat is equal to anything we ever produced, and commands top price to-day, but owing to so many seasons being unfavorable for the development and ripening of the wheat, there has been a preponderance of small grain that should have been taken out by the cleaner, but has been put into the wheat sack; consequently the whole sample is inferior, though, owing to the superior quality of the good grain, the average equals the standard ruling. This is one reason why our wheat is deteriorated in value. Another reason, and one that has worked most to our injury, is that this docked wheat has been shipped to foreign markets and sold as F.A.Q. wheat. [What proof has Mr. Smith of the correctness of this statement?—GEN. SEC.] As farmers, we can put a stop to this by cleaning our wheat properly, keeping the small and shrivelled grain for the fowls, pigs, and horses. The machinery we have is quite capable of cleaning the wheat thoroughly, provided it is not rushed through too quickly. Once through is sufficient if there are no oats, barley, or drake; but twice through may be preferable. I would advocate putting the wheat through the coarse sieves first, then through the finer sieves; and I am confident if this were done we should hear very little about badly-cleaned wheat, especially if the wheat from close to the ground is not taken. Many samples are spoilt in this way. If you get stones mixed with the wheat you cannot separate them. I have heard more complaints about stones in the wheat than anything else; the miller can make use of small grains, but not of stones. If care were exercised in this way we would have as good an average sample as we ever had. We shall, however, never place our wheat on the market to the best advantage until it is all put through a grading mill, so that a uniform sample could be shipped. I am afraid there is too much wheat to allow of the price rising sufficiently to pay for the extra expense of grading. Farmers must look to the matter themselves.

It was decided that discussion on papers read at the meetings of the Branch be deferred until they have been printed in the *Journal of Agriculture*.

Port Elliot, November 16.

Present—Messrs. J. McLeod (chair), J. Brown, H. Green, sen., H. Pannell, W. E. Hargreaves, R. E. Ullrich, J. R. Coote, J. Nosworthy, F. Basham, and E. Hill (Hon. Sec.).

MANURE TESTS.—Members inspected various plots of wheat manured with different kinds and quantities of fertilisers, and were greatly interested in the results, though, owing to the showery weather, it was not possible to go into the crops to examine them closely. All the members, however, were satisfied that a great improvement had resulted from the methods of cultivation adopted by Mr. Brown, viz., deep cultivation and judicious use of fertilisers.

Saddleworth, November 7.**INAUGURAL MEETING.**

Present—Messrs. R. Townsend (chair), W. H. Bee, J. H. Frost, G. Bengier, F. Coleman, J. P. Daly, J. H. Eckermann, W. Hannaford, and J. Scales.

BUSINESS.—Messrs. J. Frost, R. Townsend, and F. Coleman were elected Chairman, Vice-chairman, and Hon. Secretary, respectively. Four additional names were proposed for membership. It was decided to meet on the second Friday in each month, the subjects selected for December meeting being, "Harvesting of Wheat" and "Selection of Seed Wheat."

Swan Reach, October 26.

Present—Messrs. P. A. Beck (chair), L. Fidge, D. Rowe, P. A. Hasse, B. Schwartz, and J. L. Baker (Hon. Sec.).

CARE OF FARM IMPLEMENTS.—The Chairman read a paper on this subject.

This matter has often been referred to in the *Journal*, but will still bear reference to. Only recently he saw various farm implements—harrows, ploughs, scarifiers, and worse than all, the stripper and mowing machine standing either where they finished their work, or exposed to all weathers in the farmyard. This carelessness costs the farmer heavily both in time and money. The springs and finer parts of the machinery will not work smoothly when you commence work again; you have to rush to the blacksmith for little repairs and find he is flooded with other implements requiring attention, and it may be several days before you can get yours attended to. The principal excuse for leaving the implements in the field is that there is no time to attend to them when work is finished, but it is certain that a shed for them that would last for years could be put up at little expense, and the time that is now lost would be saved, besides which the machines, &c., would last much longer. All machinery, as soon as operations are over, should be put under shelter, and, where necessary, receive a coat of oil or paint, being thoroughly cleaned first, bearings being oiled also. It is surprising how far a little paint will go on a machine or implement that is regularly cared for. If anything is broken or requires attention, see that it is repaired at once. Everything will then be in good working order when required and much loss of time avoided. Besides the question of appearance, members will find that attention to their implements is profitable work.

Members agreed that the implements would last much longer and do better work if they are cleaned thoroughly when finished with, and receive once a year a coat of paint, oil, or coal tar.

STOCK COMPLAINTS.—The Chairman asked what to do for cows that persist in frequenting the rubbish heap, eating old rags, bones, &c., and leave good feed in the paddock; they are very thin, whereas there is sufficient food to keep them fat. The Hon. Secretary attributed this depraved appetite to deficiency in the natural food. He had a young heifer that would get into the stable and destroy the horses' collars, licking and chewing the lining for the salts, &c., contained in the sweat that was absorbed in the collars. He suggested placing rock salt in the feed boxes. [This matter has been frequently referred to in the *Journal*, which, I am afraid, is not studied by members as closely as it should be. Give the animals pure bonemeal and sulphate of iron occasionally, also rock salt in the feed boxes.—GEN. SEC.]

Balaklava, November 9.

Present—Messrs. P. Anderson (chair), G. Reid, A. Manley, W. H. Thompson, W. Smith, J. Vivian, G. C. Neville, and E. M. Sage (Hon. Sec.).

WHEAT EXPERIMENTS.—Discussion took place on report of experiments with wheat carried out by Mr. C. N. Grenfell, at Mount Templeton. To test the difference in germination of plump *versus* shrivelled wheat, and also the yields, he selected plump and shrivelled grains from the same bulk sample. The plants from the plump seed soon got ahead of the others, and kept

ahead, tillering and yielding better also. Members, however, took exception to the method of selection of the seed. They believed that if a wheat crop were injured by hot wind, frost, or dry weather, and the grain sown, the resulting grain might be quite equal to the grain resulting from the sowing of plump seed. They did not consider it advisable, or a fair test, to sow practically the screenings from a plump sample. Mr. Grenfell's experiment in sowing Red Indian King wheat on May 25th and feeding it off with a cow on August 27th and a horse on August 29th, until only about 2in. high, was also discussed. Members consider the crop was left much too late in the season for feeding down; on no account should crops in this district be eaten off later than middle of July. In his experiment with bunt, Mr. Grenfell used bluestone several years old, as well as new English sulphate of copper. With the former there was a lesser germination, but a greater percentage of clean plants. The Hon. Secretary considered this due to the fact that the old bluestone sample was actually stronger than the new, owing to having lost some water by evaporation, and consequently the solution made with the old bluestone was stronger than the other. This being so it would probably account for the poorer germination but greater freedom from bunt. [This is probably the explanation. Bluestone, that is, crystallised sulphate of copper, should contain as nearly as possible 63·87 per cent. of sulphate of copper and 36·13 per cent. of water. By exposure to the atmosphere a certain proportion of the water evaporates in time, while the sulphate of copper remains. This results in the percentage of the sulphate being raised. As an instance of this the analyses of samples of bluestone published in the *Journal of Agriculture* for April, 1900, may be referred to. One sample was over twelve months old, and considerably altered in appearance; this contained 67·2 per cent. of sulphate of copper. An ounce of this dissolved in a gallon of water would naturally make a stronger solution than an ounce of new bluestone, which would contain only 63·87 per cent. of sulphate of copper.—GEN. SEC.] Members were of opinion that the cultivation of the plots at Mount Templeton was carried out in a way that it could not be done on the farm. Mr. Smith tabled samples of Purple Straw and Majestic wheat sown on same day and under same conditions. The Purple Straw is 4ft. 6in. high and nearly ripe, but badly affected by rust; the Majestic was only 3ft. high and in bloom, but there were only a few specks of rust on it. Members consider the latter likely to be a good hay wheat, as it seems to have a fine straw; for grain it is too late for this district.

WORKING OF FALLOWS.—Discussion arose as to whether fallow land should be cultivated deep or shallow. Members were of opinion that ploughed fallow land should not be afterwards worked to depth of more than 2in. or 3in. Mr. Nevill said some years ago they tried the effect of subsoiling, taking off the turn furrows from one plough and breaking up the soil below, but so far as they could see there was no benefit then or at any time afterwards from this treatment. Another year they took half the tines off the scarifier and let it in below the fallow several inches, but the following crop was not benefited thereby.

Orroroo, November 15.

Present—Messrs. T. Moody (chair), M. Oppermann, E. Copley, J. Scriven, G. Harding, W. Robertson, G. Matthews, W. S. Lillecrapp, and T. H. P. Tapscott (Hon. Sec.).

FOREST-TREE PLANTING.—Hon. Secretary to inquire re planting of avenue of forest trees on the travelling stock roads, as at Redhill.

LOCUSTS.—The locusts are abundant this year, but have not caused much damage. They are now laying their eggs more abundantly than ever known before.

Minlaton, November 16.

Present—Messrs. J. Anderson (chair), A. McKenzie, J. Martin, J. Bennett, S. Vanstone, R. G. Newbold, and Jas. McKenzie (Hon. Sec.).

CREAM SEPARATORS.—Mr. E. Correll forwarded a paper to the following effect :—

There seems to be a general opinion that cows cannot exist for long on the dry limestone country such as characterises the area of Yorke's Peninsula. This is a correct conclusion when the owners of the cows trust solely to the natural herbage of the locality for their sustenance. Such reliance results in acute indigestion, impaction of the omasum, asthenic apoplexy, and various other serious diseases. The best remedy is prevention, and that result can be secured by a proper system of feeding. Feed the cows on alternating rations including copra cake, bran, silage, and good hay chaff damped; change their pasturage as often as possible. Provide a salt lick which they can get at whenever they desire, and give a little sulphate of iron in the food occasionally [and do not forget to give them a handful of finest bonedust pretty often; it will benefit the cows and enrich their manure.—GEN. SEC.] If this is done and ordinary shelter and care is given them, there will not be much loss from the above diseases. It will certainly pay well to do all this and more. The shelter sheds and milking sheds should be the cleanest, driest, and most conveniently situated that can be devised. Treat the cows with extreme kindness—it will pay well to make pets of them. Feed at milking time and they will not fret. Before commencing to milk wipe the udder with a clean wet cloth, or wash them if very dirty, and brush down the flanks. Never dip the fingers in the milk, as this is a dirty practice, and it also makes the teats hard so that they may crack and even bleed.

Much has been said and written for and against the use of private separators, and about the factory system. But the advocates on either side appear to regard the questions from the point of view as it affects their particular district and their own interests. On Yorke's Peninsula dairying would need to make great strides ere the establishment of a factory system would be justified. For the present, therefore, the private separator must reign supreme. As compared with the old pan-setting system the cream separator is as much an advance as the stripper or stringbinder is over the old sickle in harvesting cereal crops. The separator will pay 50 per cent. on its cost, even when only two or three cows are kept, as it is cleaner, quicker, and saves a deal of labor and loss. The butter is obtained with much less churning, is of better quality, keeps good longer, and at least 1lb. per cow more butter is secured through the use of the separator. The food value of the sweet skimmed milk is double that of the sour milk from the pan-setting system. To ensure best results a cool well-ventilated dairy should be made, and the most perfect cleanliness observed in every direction. Milk spilled on the floor and not properly cleaned up will soon produce a very strong malodorous effect. Much of the work connected with the dairy should be done by the men folk. Cream can be sent to the factories in Adelaide with advantage, especially in summer, when butter would suffer considerably, and sell at much less price than butter made from cream sent from the same dairy at same time and made into butter in the city. My best cow averaged 8½lbs. butter per week when the pan-setting was in vogue, but increased to 10lbs. when the separator arrived. The extra value, at 8d. per pound, made 1s. per week, or £2 12s. per annum for the cow, which gives 5 per cent. interest on £52.

Inkerman, November 19.

Present—Messrs. W. Fraser (chair), Jas. Sampson, J. Lomman, W. Board, C. H. Daniel, C. E. Daniel (Hon. Sec.), and four visitors.

HOMESTEAD MEETING.—This meeting took place on the farm of Mr. C. H. Daniel.

BEST HORSE FOR THE FARM.—Mr. C. H. Daniel, who has had a life-long experience with horses, for a long time had favored and bred heavy draughts; but latterly had come to the conclusion that the best all-round farm horse is the good stout roadster. For roadwork or for market, however, nothing equals the heavy draught horse—the heavier the better, if shapely—as such always command a high price. He had found that the light clean-legged horses moved along better, and always held their own with the heavy draughts. Mr. Sampson agreed, and considered that a cross from a high-class roadster and a draught mare made a good serviceable farm horse. Mr. Broad did not agree with Mr. Sampson, as the lighter class of horse had not strength enough for farm

work, and were also too spirited or fiery. He preferred a good solid draught horse. The Chairman said the mistake is often made of placing a light quick horse alongside a slow heavy horse in the team. The light horse goes too fast for the heavy one, and if a draught horse is hurried out of his ordinary pace he is soon tired out. Mr. Lomman prefers the lighter horses for harrowing or for working on soft land; but for heavy work, where there is solid footing, the draught horse is best.

SHEEP.—Mr. Board said, in England it was found that the progeny from a cross between a large ewe and a small ram was better than that from a cross between a large ram and a small ewe. They fattened better; were of better quality. Mr. J. Sampson concurred, if fat lambs only were required; but for all-round purposes the Merino is best. A visitor remarked that the cross between the Shropshire ram and Lincoln-Merino ewe is best. On a vote being taken, the majority favored the Shropshire ram and Merino ewe cross for this district.

Ardrossan, November 23.

Present—Messrs. G. J. Freeman (chair), J. Henderson, C. Dinham, W. Lodge, J. Hill, and N. Opie (Hon. Sec.).

WHITE PATCHES IN WHEAT.—Mr. Lodge thought these are caused by "take-all." [Take-all kills the plant outright long before the heads are seen.—GEN. SEC.] Mr. Henderson said it was known long since as "hay-blight." He had watched carefully, and was satisfied that termites or "white ants" were the cause. He had found the termites in the stalk. The disease occurs in spreading patches, which are more numerous in wet seasons, when swarms are plentiful; and noticed it more in valleys, where currents of air drift. [Termites do not attack the living part of any tree or plant, but do eat the dead heart wood of living plants. Closer and more careful investigation will show that termites are not the cause of "take-all" or of the white heads in wheat crops.—GEN. SEC.]

SALT.—Mr. Henderson spoke of the objectionable hardness in cured meat through the use of "colonial" salt, and thought magnesia is the cause. Imported salt kept dry when the colonial salt becomes moist.

MEMBERS' ROLL.—Decided to enforce rules and strike off the roll the name of any member failing to attend meetings thrice consecutively without sufficient and written excuse.

Wandearah, October 30 and November 25.

Present—Messrs. Geo. Robertson (chair) (2), W. Roberts (2), E. H. Eagle (2), J. Wall (1), W. Roberts (1), T. Joyce (2), W. Munday (1), W. J. Fuller (2), W. Halliday (1), G. Collins (1), J. Kurl (1), C. E. Birks (2) (Hon. Sec.), and one visitor.

BEST WHEATS.—Members did not decide which are the best varieties of wheat for the district, but consider Marshall's No. 3, though rather late, is a good sort. Bluestone is considered by a majority to be the best for pickle, though strong lime and water is said to be an effectual remedy against bunt.

BEST DAIRY COWS.—After discussion it was decided that the best dairy cow results from a cross between the Jersey bull and Shorthorn, or a good ordinary cow.

MANURING.—Chairman eulogised Mr. F. E. H. W. Krichauff's pamphlet on manuring, which he would like to see commonly used for reference.

TAKEALL AND BLACK RUST.—Members consider that black rust and take-all are most prevalent on land that has been worked dry. Cats and peas should precede a wheat crop on land subject to takeall.

POISONED COWS.—Mr. Wall reported death of two cows through chewing rabbits that had been poisoned with phosphorised pollard. Wanted to know if there is any cure in such cases, and whether there is danger of the cattle being poisoned through chewing dry rabbits that have been poisoned with strychnine? [Great danger and no cure. But dead rabbits should be gathered and burned, and the cattle should have a good handful of fine bone-dust given in damp chaff, pollard, or bran two or three times a week; also a little sulphate of iron, and common salt should be placed where the cattle can always get at the mixture.—GEN. SEC.]

Meningie, November 16.

Present—Messrs. M. Linn (chair), Thomas Joy, W. Robinson, Wm. Wilks, H. May, C. J. Shipway, S. F. Robinson, A. J. Myren, and H. B. Hackett (Hon. Sec.).

ANNUAL MEETING.—Hon. Secretary reported eight meetings had been holden with an average of nearly eight members. Four papers had been read and six important matters had been discussed; two members added and one struck off the roll, and there are now fourteen members.

OFFICERS.—Officers were thanked and re-elected.

POULTRY DISEASE.—Mr. Shipway has some fowls which became blind. A growth commenced on the eyes and later developed a hard lump. [This is probably chicken-pox or "warts." First signs are whitish lumps on the eyelids or elsewhere. Use carbolised vaseline applied twice a day, and feed soft food with a little chopped meat and lots of green food. If many fowls affected sprinkle chloride of lime liberally on the floor of the house. If only two or three birds affected isolate them. The disease may be canker, in which case bathe the eyes with water in which a little eucalyptus oil has been mixed.—GEN. SEC.]

Finniss, November 3.

Present—Messrs. Jas. Chibnall (chair), W. W. Heath, A. Greer, F. Dreyer, T. Collett, A. E. Henley, and S. Collett (Hon. Sec.).

HOMESTEAD MEETING.—Members met this time at Mr. Henley's farm, and inspected his crops. Crops of wheat and oats reserved for grain and mixed oats and wheat for hay all showed conspicuously the advantage of using phosphatic fertilisers. So far as appearances went, those portions which had received the heaviest dressings will give the heaviest crops and the greatest profits. One field, recently covered with mallee and broombush, dressed with a little over 100lbs. per acre, will probably yield 16bush. per acre.

Caltowie, November 25.

Present—Messrs. H. Kerr (chair), G. Petatz, J. Neate, J. H. Both, J. Potter, A. McDonald, S. Wenham, and F. Lehmann (Hon. Sec.).

RED RUST.—This parasitic fungus has attacked many wheat crops in this locality, with serious results. Messrs. Kerr and Neate noted that Smart's Early has best withstood the attack. Messrs. Potter and Graham think the hot winds have hurt the wheat more than the rust has, because the previous rains had made the grain soft and sappy. Petatz Surprise wheat appears to be practically rust-resisting.

WHITEHEADS.—Whiteheads in wheat crops are very prevalent this year, and some members think they are the result of takeall, whilst others think termites are the cause. [Takeall leaves nothing; the plants die away before any head or material growth has been made. The termites, or white ants, do not attack wheat plants, but may of course be found in the soil amongst the roots. It is possible that the disease called "wheat-stem killer"—prevalent in Germany—is the cause of these dummy heads. Investigation is being conducted at present to test this question.—GEN. SEC.]

LUCERN.—Mr. Both tabled splendid sample of lucern, six weeks' growth, over 2ft. long, which had been watered from a well and sheltered against hot winds.

MISCELLANEOUS NOTES.

LEMON BEER.—Take 3lbs. sugar, three lemons (sliced), 3galls. boiling water, 3ozs. ground ginger; boil five minutes, stirring well. When cooled to blood heat (98° F.) add 1pt. of yeast. Let stand for twenty-four hours, then bottle. Can be used after three days.

STRAWBERRIES, RASPBERRIES, APRICOTS, and similar fruits can be preserved with all their pure flavor by using 20ozs of pulverised sugar to each 16ozs. of fruit, in alternate layers of sugar and fruit. Apricots and other large fruits should be stoned, halved, and laid cut side uppermost. Commence and finish always with a layer of fruit.

TOMATO FIGS.—Scald good solid tomatoes and skin them; weigh them, and place them in layers in a stone jar with as much weight of sugar as there is of fruit. Let stand two days, then drain off the syrup, boil and skim it until no scum rises. Pour again on the fruit and leave two days; then boil and skim, and pour on again, as before. Do the same a third time. After two days, or as soon as the weather is clear, hot, and fine, spread the tomatoes on dishes exposed to the sun. They will be dry enough in four to six days. Then pack in small boxes with a little fine sugar between the layers.

THE BY-PRODUCTS OF THE PIG.—The by-products of the pig are most interesting (says the British Consul, Mr. Wyndham, of Chicago). From the horny parts are made mouthpieces for pipes, combs, buttons, and fertilisers; from the skulls, hoofs, and knuckles, glue and fertilisers; from the hoofs, buttons, knife-handles, and cyanide of potassium; from the bones, chessmen, dice, tooth brush and table knife handles, all kinds of "ivory" articles, and imitation buck-horn pocket-knife handles. The bone refuse is all ground up for fertilising purposes, and some of the dust is sold to a man who has a secret process by which he makes billiard balls. Many women are employed labelling tins, packing meat in tins, and making knife handles. Enormous quantities of knife handles are shipped to the United Kingdom. Extract of meat is made from some of the blood, and the albumen is extracted from the rest and sold for sugar-refining and leather-dressing. Gelatine is made, and neatsfoot and other animal oils. Sinews and bladders are used for many purposes, and their hair is cleaned and curled for upholstery. Butterine, soap, ammoniates, pepsin, and blood meal are made, and everything that escapes these uses is turned into axle grease and fertilisers. It is claimed by the large companies that their profits arise more from the by-products of the slaughterhouse than from the sale of the meat. The solution of the question of utilising everything and refrigeration have made the country butcher's business in some cases unprofitable, and thrown much of the trade into the hands of the large houses operating at centres scattered through the countries, from which many butchers now draw their supplies.

SOUTH AUSTRALIAN RAILWAYS.

Parcels and Passengers' Luggage.

COLLECTION AND DELIVERY AT ADELAIDE, PORT ADELAIDE, AND GLENELG.

The attention of passengers is called to the fact that the Railway Department collects and delivers all parcels and luggage in Adelaide, Port Adelaide, and Glenelg, or in the suburbs mentioned below, thus avoiding inconvenience and loss of time to passengers. Such parcels and luggage will not, however, be accepted for delivery on board any vessel lying at Port Adelaide, but passengers claiming their luggage at that station can have it carted to the wharves or sheds where vessels are loading.

The charges for collection or delivery are as follows :—	In Adelaide, Port Adelaide, or Glenelg.	To or from any of the undermentioned Suburbs.
	s. d.	s. d.
<i>* Luggage.</i>		
For each package not exceeding 28lbs.	0 3	0 6
For each package exceeding 28lbs., but not exceeding 112lbs.	0 6	1 0
For every additional 112lbs., or part thereof, per package ..	0 6	1 0
<i>Parcels.</i>		
For each parcel not exceeding 14lbs. in weight	0 3	0 6
For each parcel exceeding 14lbs. but not exceeding 56lbs. ..	0 6	1 0
For every additional 56lbs., or part thereof, per package	0 6	1 0

* Charges to be made on the aggregate weight when luggage belongs to one person.

Delivery carts leave the Adelaide Station on week-days at 9 a.m., 11 a.m., 2 p.m., and 4.30 p.m., for delivery within the municipal boundary of Adelaide; and for delivery in the suburbs at 2.15 p.m.; at Port Adelaide as often as may be required between the hours of 8.0 a.m. and 6.0 p.m.

Special attention will be given to this service in order to ensure prompt and safe delivery. Unless parcels received in Adelaide and Port Adelaide are addressed "To be left till called for," the Department will deliver at above rates.

Suburbs to which the Collection and Delivery Service Extends.

Adelaide Municipality—Clarence Park, College Park, College Town, Eastwood, East Adelaide, Frewville, Gilberton, Goodwood, Hackney, Hyde Park, Hilton, Kenilworth, Kensington, Keswick, Kent Town, Malvern, Medindie, Mile End, Norwood, Parkside, Portland, Prospect, Rose Park, Rosewater, Stepney, Southwark, Thebarton, Unley, Unley Park, Victoria Park, Walkerville.

Port Adelaide Municipality—Birkenhead.

Glenelg—Somerton.

Notice to Passengers.

If you require your luggage delivered by the Department, either in Adelaide, Port Adelaide, or in any of the above-mentioned suburbs, have it fully addressed, and hand it to the stationmaster at the station where you begin your journey, who will arrange to forward it.

PARCELS RATES.

Any distance not exceeding—	Weight not exceeding						For each additional 14lbs. or part thereof.
	7lbs.	14lbs.	28lbs.	56lbs.	84lbs.	112lbs.	
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
10 miles	0 6	0 6	0 6	0 8	1 0	1 4	0 2
20 "	0 5	0 6	0 6	1 0	1 6	2 0	0 3
40 "	0 6	0 6	0 8	1 4	2 0	2 8	0 4
60 "	0 6	0 6	0 10	1 8	2 6	3 4	0 5
80 "	0 6	0 6	1 0	2 0	3 0	4 0	0 6
100 "	0 6	0 7	1 2	2 4	3 6	4 8	0 7
140 "	0 6	0 8	1 4	2 8	4 0	5 4	0 8
180 "	0 6	0 9	1 6	3 0	4 6	6 0	0 9
220 "	0 6	0 10	1 8	3 4	5 0	6 8	0 10
260 "	0 6	0 11	1 10	3 8	5 6	7 4	0 11
300 "	0 6	1 0	2 0	4 0	6 0	8 0	1 0
For each additional 50 miles or part thereof }	—	0 1	0 2	0 4	0 6	0 8	0 1

When two or more parcels are consigned to one person the above rates are charged on each parcel separately.

Parcels addressed "Murray Street Terminus, Gawler," "To be called for," may be booked at station to station rates.

Fresh meat, butcher's small goods, and fresh fish (when in baskets or boxes, or packed in bagging or calico), butter, eggs, dead poultry, game, mushrooms, cut flowers, ice in boxes or bags, and South Australian fresh fruit are carried at half parcel rates; minimum charge 6d. This applies also over Silverton Tramway. Unless such packages are marked "Till called for" they will be delivered in Adelaide and Port Adelaide at the following rates:—Not exceeding 14lbs., 3d.; not exceeding 56lbs., 6d.; not exceeding 112lbs., 9d.; not exceeding 224lbs., 1s. 3d.; not exceeding 336lbs., 1s. 9d.; for each subsequent 112lbs., or part thereof, 3d. The South Australian rail and delivery charges are to be calculated on the aggregate weight of each consignment, and the latter charges must be doubled for delivery outside the city but within a radius of two miles of the General Post Office.

All fish, fruit, meat, poultry, and other perishable articles are conveyed at owners' risk, and are liable to immediate sale if not claimed and charges paid on arrival.

Packed parcels in hampers, crates, bags, cases, or other packages are charged quadruple parcel rates, and the onus of proving that the parcels are not packed rests with the consignees or consignors.

The Railways Commissioner will not be accountable for any parcel above the value of £5, unless the nature and value of the articles or property contained in such parcel shall have been declared by the sender, and an insurance rate equal to 1 per centum upon such declared value shall have been paid, in addition to the amount chargeable by the foregoing scale of rates.

Feathers, furniture, glass, hats, bonnet and hat boxes, cases of millinery, straw bonnets, mirrors, musical instruments, sulkies in pieces, pictures, sewing-machines, wickerwork, wire cages, or other articles light or fragile, are charged 50 per cent. above parcels rate (Port and Glenelg lines excepted).

Returned empties, actual weight, single rate, must be prepaid.

Parcels which are intended to be booked by any particular train must be delivered at the forwarding station at least fifteen minutes previous to its departure; otherwise they may be detained until the departure of the following train.

Parcels waybilled, and addressed "To be left till called for" at the chief stations, will, if not called for within forty-eight hours thereafter, be subject to the same charges and regulations as left luggage.

The Railways Commissioner will not be responsible for the loss of, or damage to, any goods or parcels addressed "To be left till called for."

No live small animal or bird will be received for carriage by railway unless confined in a proper coop or case, and the stationmasters and guards will be authorised to refuse any coop or case which, in their judgment, is too small for the purpose to which it is put, or, being fit, is so overcrowded as to cause needless suffering to the birds or animals it contains.

PARCELS FOR OCEAN STEAMERS.

For an additional charge of 1s. for each 56lbs., or part thereof, parcels will be placed on board ocean steamers at Largs Bay.

CREAM AND MILK.

These will be carried, at owners' risk only, in the brake-vans of passenger trains at the rates and subject to the conditions following:—

Not exceeding 25 miles ½d. per gallon

For each additional 25 miles, or part thereof ½d. "

Minimum charge 6d.

Skimmed milk from butter and cheese factories, to which it has previously been carried by rail as fresh milk:—

Not exceeding 25 miles ½d. per gallon

For each additional 25 miles, or part thereof ½d. "

Minimum charge 3d. "

Cream and milk will only be received in properly constructed drums, which must be quite water-tight. Each drum must be impressed with its capacity in gallons, and with the names of the owner and station.

The charge will be made upon the capacity impressed upon the drum.

Empty return drums, 1d. for each consignment of 28lbs. or part thereof for each 100 miles or part thereof.

COOL CHAMBERS.

During the hot season cool chambers run as under:—

Between Adelaide and Broken Hill.

From Adelaide on Tuesdays and Thursdays, at 5·30 a.m.

From Broken Hill on Wednesdays and Fridays, at 8·10 a.m.

Between Port Pirie and Broken Hill.

From Port Pirie on Mondays and Thursdays, at 6·50 a.m.

From Broken Hill on Tuesdays and Fridays, at 8·10 a.m.

Between Adelaide and Quorn.

From Quorn on Mondays and Thursdays, at 8·18 a.m.

Between Adelaide and Moonta.

From Adelaide on Wednesdays and Mondays, at 7·40 a.m.

From Moonta on Thursdays and Tuesdays, at 6·25 a.m.

Between Adelaide and Port Pirie via Blyth.

From Adelaide on Tuesdays and Fridays, at 5·30 a.m.

From Port Pirie on Thursdays and Mondays, at 9·28 a.m.

Between Adelaide and Mount Gambier.

From Mount Gambier on Tuesdays and Thursdays, at 7 a.m.

Between Adelaide and Eudunda.

From Adelaide on Wednesdays and Saturdays, at 11.50 a.m.

From Eudunda on Thursdays and Mondays, at 10.20 a.m.

Between Adelaide and Milang.

From Adelaide on Mondays and Thursdays, at 7.30 a.m.

From Milang on the same days, at 2.40 p.m.

From Quorn to Hergott Springs.

On each Saturday, at 8.34 a.m.

Packages of butter only will be received for conveyance by these chambers, but must be so marked.

Goods forwarded in the cool chambers will be charged half parcels rates, minimum 6d.

DELIVERY CHARGES, FREEZING DEPOT, PORT ADELAIDE.

On packages sent by passenger train:—

For each consignment not exceeding	14lbs.	.....	3d.
“ “ “	56lbs.	.....	6d.
“ “ “	112lbs.	.....	9d.
“ “ “	224lbs.	.....	1s. 3d.
“ “ “	336lbs.	.....	1s. 9d.

Each subsequent 112lbs. or part thereof..... 3d.

Carriage and delivery charge must be prepaid.

PARCELS DELIVERY, COUNTRY TOWNS.

Parcels, *unless* directed “*To be left till called for,*” will be delivered within the municipal boundaries of Gawler, Kapunda, Port Augusta, Wallaroo, and Moonta at the following rates:—Parcels up to 112lbs., 6d.; above 112lbs. and not exceeding 196lbs., 1s.; above 196lbs., 1s. 6d.; Mount Gambier, irrespective of weight, 3d.

INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

Number of Persons Registered and Found Employment by Government Departments and Private Employers from October 30 to November 29, 1901.

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youths	56	114	203
Carpenters	2	—	1
Granite dresser	—	—	1
Blacksmiths and strikers	6	1	6
Boilermakers and assistants	4	1	—
Iron and brass moulders	2	—	—
Fitters and turners, &c.	6	—	1
Compositors	—	—	7
Bookbinder	1	1	—
Caretakers, watchman &c.	—	—	3
Pipelayers	1	—	1
Fettlers, &c.	3	—	—
Enginedriver and fireman	3	—	—
Master mariner	—	—	1
Cook and sculleryman	2	—	1
Married couple	—	—	1
Glut hands	—	—	2
Apprentices	9	3	1
Cleaners	8	6	—
Porters and junior porters	9	5	8
Rivet boys	—	—	3
Totals	112	131	240

November 29, 1901.

A. RICHARDSON, Bureau Clerk.



Journal of Agriculture

AND

Industry.

No. 6. REGISTERED AS]

JANUARY, 1902.

[A NEWSPAPER.

VOL. V.

NOTES AND COMMENTS.

The weather during December has, on the whole, been very favorable to harvesting operations, the continued fine warm weather facilitating stripping. Reports concerning the damage by rust vary; in many cases complete failure is reported, but it is still doubtful whether as much injury has been done as was feared a month ago. In the Far North, as well as on the Murray Flats, the harvest will again be very poor, and complaints of shrivelled grain are numerous. Owing to the lateness of the season the hot winds of November injured the crops more than was anticipated.

In connection with the codlin moth question there is one matter worthy of careful consideration. This year the crop in many orchards is not only very patchy, but the fruit is also "scabby." It is probable that the growers in such cases will secure a very small proportion of marketable fruit, and under these circumstances it will pay them to pick it all at once and destroy it. Several growers who have picked the whole crop in this way report that the fruit for three or four years remains free from codlin moth if there are no immediate neighbors to furnish, through their neglect, a fresh supply of moths. Where orchards are situated some distance apart it is nearly certain that by sacrificing one crop in four the growers would secure clean fruit at less expense than if they leave the crop and fight the pest each year. It will require some amount of courage to sacrifice the crop, but if the opportunity afforded in a year like the present is availed of the first loss will not be large, and the returns from the following years will be sufficient to compensate the grower.

It is admitted by all growers that bandaging of trees and regular examination of the bandages is of great assistance in checking the increase of the codlin moth. Under the auspices of the New South Wales Agricultural Department an orchard containing 335 trees, many badly cankered and affording plenty of protection for the codlin moth caterpillars, was secured for the purpose of carrying out certain experiments for the suppression of the codlin moth. During the season 1899-1900, 18,505 caterpillars were caught in the bandages, and the

following year 25,796 were so caught. The crop the first year was very light, and the second year it was heavy. Through the season the highest number of grubs trapped on any tree was 673 in eleven examinations. For bandaging, strips of cheese cloth 15in. wide were used, and tied with binder twine. The cloth was folded before tying, and again after tying, making four folds; cost, 2d. each for bandages 36in. long. Two balls of binder twine, costing 2s. 6d., sufficed for the season's work. When cost of obtaining bags and cutting them up, as is the usual practice, is taken into account it will be seen that the cheese cloth is cheaper, besides which there will be less time lost in cutting and measuring the bandages. Where the material is in a roll just enough can be cut off to go round the tree; but where cut from old bags, &c., there is a lot of trouble and waste of time getting suitable sized bandages.

Several times during the month soft jam fruits have fetched extremely low prices. The buyers, when there is a good supply of fruit, can practically get it at their own price by holding off until the market is closing, as the fruit must be sold or it will spoil. This is a difficulty that the growers could easily overcome by co-operation. If several in one district would unite to purchase the appliances for canning the fruit (neither expensive nor elaborate) they could preserve it as "pulp" or "pie-fruit" if the price offered by the manufacturers was not satisfactory. The method of preserving pulp by this means is both simple and inexpensive, and the outlay would soon be recouped. The fact that the growers were in a position to help themselves would itself be an inducement to buyers to offer reasonable prices, while at the same time the manufacturers would be protected against any attempt at extortion on the part of the growers, on account of our markets being open to fruit from the eastern States.

The question of the best setts of potatoes for planting is one of considerable importance to potato-growers. Many experiments have been conducted, with a view to ascertaining whether whole setts are better than cut setts, but results are contradictory. Doubtless the conditions of the soil and climate affect the results. An American grower, however, states that whole setts will mature the crop seven to ten days earlier than cut setts. On the other hand, is it not probable that to continue the use of small whole potatoes the produce of small potatoes for several generations will result in considerable deterioration? Then, another point is the treatment of cut setts. In America and elsewhere it has frequently been shown that if the cut setts are sprinkled with gypsum or slack lime, and left for a day or two before planting, there will be fewer misses and better returns than from planting freshly-cut setts. Of one thing there is little doubt, the average potato-grower does not pay sufficient attention to the selection of his seed potatoes. It would not be a great trouble to put aside the produce of the plants yielding heaviest returns, while, unless potatoes are different from all other plants, the increase in the returns would amply repay the grower.

There are great differences in the quantities of water contained in butter. One lot of butter may appear to be dry and yet contain about 20 per cent. of water, whilst another will appear to have a lot of water and yet contain no more than 8 per cent. of water. Butter churned at a low temperature and properly "made" will be really dry and contain 8lbs. to 10lbs. water in 100lbs.

butter, whilst butter churned at a temperature of 70° to 90° F. and badly worked will probably contain 25lbs. in 100lbs. butter. There are many things that will increase or decrease the weight of "butter" obtained from a 10-gallon can of cream; but the housewife who buys the butter is not always aware that she is paying for a little butter and a lot of water.

The best audience for a reformer or an advocate for progression is a country gathering. The farmer could never succeed without brains and without knowledge. It may appear to the junior clerk or the young fellow just away from the school to be very smart to speak of "clodhoppers" "yokels," and "old hayseed," but the old farmer could give him points in knowledge and wisdom, and come out a long way ahead, especially when listening to a lecture or an address. There may be one or two at such a meeting who ask awkward questions, or raise objections, or cite cases which apparently upset the arguments advanced; but this is generally done by some sly old chap who wants to draw out more information or to throw a stronger light upon the subject under discussion.

There is nothing more humiliating than to realise how little we know. If one were to shut himself up for an hour or two with a pencil and paper to write down all that he knew, he would find a difficulty to occupy his pencil after the first half hour; but if he started to catalogue what he does not know it would involve imprisonment for life and an unfinished job. The city man may rub along with the little knowledge that he possesses, but he who obtains his living from the soil must keep up the learning of fresh facts, new ideas, and "wrinkles" that will help him in his business. If all farmers and gardeners were half as ignorant as some of the city "swells" think them to be the world would die for want of the necessities of life. The acquisition of money is not employment for noble and wise men, and he who has most of it may have good reason to envy the tiller of the soil who possesses health, happiness, and just enough for his bare necessities.

Anyone who will advertise for sale at a high price the seed of a plant that will produce an annual crop of 30 tons of green feed on an average rainfall of 10in. will secure a considerable number of dupes; and the Government will be strongly urged by others to procure for free distribution seeds of the miraculous plant. We have had ample experience in this direction, and more than enough money has been expended in proving the "claims" to be utterly untrue. When we have properly-equipped experimental stations established they will be profitable to the State in the improvement of well-known economic plants and animals, and in the introducing and testing of new species and varieties.

One of the mysteries of farm life is that of how the farmer will neglect his own comfort and that of every other person about the farm. He could make the whole place look comfortable and feel comfortable by raising a good lot of trees to serve as a windbreak and general shelter; he could raise at least some vegetables and fruits, keep a few head of various kinds of poultry to supply his table, and in a hundred other ways make life easy and comfortable. But look at the great majority of farms and judge whether there is anything tempting about them.

On the Darling Downs (according to the *Queenslander*) there are many paddocks of wheat which looked good enough for 40 bush. per acre a very short time ago, but the ears of which have proved to be without grain. Red rust, as usual, has done much injury; but the "grainless" disease has utterly ruined many of the crops which might have been cut for hay had the state of things been discovered sooner. If a reliable rust-resistant wheat of high milling quality can be discovered the Darling Downs would offer unequalled advantages to the wheatgrowers; but until that ideal is attained would it not pay better to grow maize, for which the locality appears to be eminently suitable?

The botfly has come to stay with us, and our horses will be at times driven frantic through the persistent efforts of the flies to affix their eggs around the lips and accessible parts of the horse's anatomy, where the places can be licked or bitten by the equine animal. To minimise the trouble the horses should be attended to at least once a day, the hair under the chin, around the mouth, on the legs, and wherever the horse's mouth can reach should be cleaned and rubbed over with a cloth damped with dilute carbolic acid. The bots in time are passed with the dung, and it would be well to burn as much as possible of it.

The sooner the people of Australasia arrive at a perfect knowledge of the vital importance of planting extensively of forest trees and the strict conservation of the present existing trees the better will it be for themselves and for future generations. There are many societies in existence having for their objects matters which cannot bear any comparison with the urgent necessity for consideration of the subject of the reforestation of this great island continent. It may be argued that there are scientific men who deny the fact that forests have any influence upon climate and rainfall; but there are a great many others who are equally scientific, who have closely studied the subject and whose conclusions are borne out by innumerable historical incidents, who are firmly persuaded that floods, blizzards, tornadoes, excessive heat, droughts, and innumerable other disasters are the direct outcome, in many instances, of the extensive denudation of forest lands. Every human being is interested in this question, and should be satisfied one way or the other. Inquiry and settlement is urgently necessary. If the assertions of the advocates for establishment and conservation of forests are correct—and we feel certain that they are—then the sooner we are all convinced and eager to set about the work the better for everybody. But even supposing that extensive forests do not exercise any influence upon climatic conditions, the economic side of the question is worthy the close, undivided attention of every person having the true interests of the Australasian Federation at heart. An association of learned and intelligent persons for consideration of this matter would be one of the most useful and valuable that could be instituted. Who will take the leadership?

When there are plenty of trees there will be numbers of birds. If the trees do not bear edible fruits the varieties of birds existing there will either be honey-eaters or insect-devourers. Amongst the honey-eaters are numerous species of parrots, parakeets, &c. On bare plains and comparatively treeless regions there will never be many birds other than those which live upon seeds, or such that are carnivorous. No amount of legislation will tend to the increase

of useful birds unless that legislation helps in the establishment of trees and shrubs. Is there any lady in the whole of Australasia who wears, or is likely to wear, the feathers or stuffed skin of any bird indigenous to this part of the world?

The editors of certain Australasian newspapers are afflicted with a mental obliquity which prevents their recognising the dishonesty of appropriating articles without leave from the owners. This is particularly noticeable in respect to articles written by officers of the various departments of agriculture for the monthly journals published by those departments—so much so that in several of the States the departments have been driven to copyright their properties. The officers are paid by the States to do certain work, amongst the duties being the education of the public by writings in the departmental journals. The newspapers copying those writings are in the habit of publishing the same as having been written by the authors for their own newspaper, carefully omitting the fact that the articles were written expressly for the departmental journal, and thus the readers are deluded into the belief that the newspaper proprietor has engaged the whole of the State specialists—professors, horticultural, agricultural, and other instructors—to write for his columns. The imputation of deceitfulness and dishonesty could easily be exploded if the proprietors of those papers would notify—in the usual way—that the borrowed article was written by such and such a person for the *Agricultural Journal* of Queensland, or New South Wales, or South Australia, or otherwise, and neither the officers in question nor the departments would feel aggrieved. Under present conditions, where no copyright is enforced, there are several officials who neglect to contribute to their departmental journals, because their writings and their names are piratically used by unscrupulous editors.

Probably the following treatment will be found quite as effectual in destroying grass trees (*Xanthorrhoea* sp.) as it is said to be in exterminating *Zamia*, since both kinds of plants grow inwardly, or from the centre. The letter was written by a back country settler to Mr. P. R. Gordon, Chief Inspector of Stock for Queensland:—"After many experiments in destroying *Zamia*, the following method is, I find, the simplest and cheapest, and the only items necessary for the destruction of it are arsenic (dry), a billy-can, a dessert spoon, and an energetic man at the end of the spoon. First of all I may say that $\frac{1}{2}$ oz. (a dessertspoonful) put into the heart of the plant, with no need for puncturing, will, after a little rain, cause the plant to die right out in a few weeks. As 1 cwt. of arsenic means 3,584 half-ounces, it will account for the destruction of that number of plants at a cost of about 35s., plus carriage and labor. Stock can be kept off the country while the arsenic is working into the plant, though I am sure there would be no risk of losses if the work is carefully done, and it might be done at the time of year when stock don't touch the plant, just before the wet season, or between storms."

Beekeepers will probably have a good harvest this year, since the Eucalypts, especially the better sorts, are showing for heavy blossoming. There are a few advanced beekeepers in this State who convey their bees from place to place, wherever the scrub and large trees may be in flower. A barge on the Murray would place a considerable number of hives as required, where the best harvests could be gathered. In Europe, also in Egypt, it is quite a common practice to remove bees from place to place, and this is done most frequently with the aid of rafts and flats.

FERTILISERS FOR ORCHARDS.

The manuring of orchards in this State is practically in its infancy, few growers making it a practice to manure their orchards regularly. That the practice will pay there is no question, as the experience throughout fruit-growing countries is that well-manured trees will bear better fruit and withstand the vicissitudes of climate better than unmanured trees. It is necessary to successful fruit production that there should be a constant transfer of nutritive juices from the tree to the fruit throughout the entire growing season, while the growth for each year is dependent upon the nutrition stored up in buds and branches as well as upon the food derived directly from the soil each season. In this of course it differs from annual crops of cereals and vegetables; with these the fertilisers must be of such a nature that the plant food is quickly available. With perennial trees the fertilising materials should be such as will provide for a regular and continuous supply of plant food. Those forms which decay and become available comparatively slowly may be equally as good, if not better than the readily soluble manure. To obtain the best results at the least expense of money and labor, manures containing portion of their fertilising ingredients in a quickly available form, and portion only available by degrees, will probably give the most satisfaction to orchardists.

Phosphoric acid, potash, and nitrogen are all of importance in the manuring of fruit trees, but great care must be exercised in the application of nitrogenous fertilisers. Nitrogen encourages leaf-growth, and a tree will not make even normal growth on soils deficient in nitrogen; but, on the other hand, an excess of nitrogen will cause growth of leaf and wood at the expense of the fruit. Potash enters largely into the composition of both the wood and the fruit, and is a most essential element in any formula. Lime also has an important bearing on stone fruits in particular. According to Professor Vorhees its functions appear to be to strengthen the stems and woody portions of the tree, to shorten the period of growth and hasten the time of ripening. The same authority also states that the quality, *i.e.*, size and appearance, of the fruit is largely dependent upon an abundant supply of plant food.

As a basic formula upon which to work Professor Vorhees recommends (*a*) a mixture of one part each of bonedust, superphosphate, and muriate of potash; or (*b*) three parts of bonedust to two parts of muriate of potash. For young trees from 4cwts. to 6cwts. per acre, according as the soil is naturally rich or poor; and for old-established trees up to 10cwts. per acre should be applied. Some kinds of trees require more than others. For apples and pears the heavier dressings are recommended. The necessity for nitrogen will generally be shown by the lack of vigor and color in the foliage, and should be met by dressings of nitrogenous fertilisers, either mineral or by growing green crops to plough under. As green manure crops add other constituents to the soil, and also have a marked effect in bettering the mechanical condition of the soil, they should receive more attention than they do. For soils deficient in lime Thomas phosphate will undoubtedly be the most suitable form in which to apply phosphoric acid. Muriate of potash is the cheapest form of potash, and for fruit trees is equally as good as any of the more expensive forms.

With soil of fairly good character it is probable that the best base for mixtures for South Australian orchardists will be the Adelaide Chemical Works' bone super., which contains about 86 per cent. of phosphate of lime (about one-half being soluble in water) and 3 per cent. nitrogen. To this muriate of potash sufficient to meet the requirements of the trees should be added, and where necessary nitrate of soda, or blood or offal manure, containing a high percentage of nitrogen, should be applied. We have practically no experience

under local conditions to guide us as to the quantity of potash to apply, but four parts of bone super. to one part of muriate of potash would give a fertiliser containing nearly 12 per cent. of potash, 30 per cent. of phosphate of lime, and $2\frac{1}{4}$ per cent. of nitrogen. The cost of such a mixture would amount to about £6 15s. per ton. Experiments are required to determine whether more or less potash is required. Professor Vorhees' formula would give from 17 per cent. to 20 per cent. of potash in the mixture.

One important point in this connection that must not be overlooked is the method of distribution. The fertilisers should, as far as possible, be distributed throughout the lower layers of the soil, where the feeding roots are located. If left near the surface the roots will be encouraged near the surface, and the trees be more liable to injury from drought and cultural operations. It will, therefore be advisable to apply the fertiliser on the surface and plough it under. The slower acting forms should be applied early in the winter, while the more soluble fertilisers can be applied at the spring working of the soil.

ORCHARD NOTES FOR JANUARY.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

The main work in the orchard will now consist of gathering in the fruit crops as they ripen each in its respective order. Up to the present the returns have been very complicated, but, on the whole, the crops of fruit in the orchards of this State may be safely estimated as falling below the average. Strawberries have been borne in ordinary quantities; cherries have been scarce, and the bird pest has proved a serious tax upon the fruitgrowers' energies and skill. While these notes are going through the press the apricots will be ripening, and those who are fortunate enough to have a good quantity of first-class fruits are to be congratulated as possessing something not common. Peaches promise to be plentiful, and unless rain falls very soon there is bound to be a large quantity of inferior fruits upon the market. Where these are still hard and green a good watering will improve them considerably. Pears are only a moderate crop in most gardens, and apples are distinctly disappointing.

In the wetter districts the "black spot" (*Fusicladium*) has wrought great havoc, and between this fungus disease and the codlin moth the already limited crops must be further diminished.

Very little can be done now in the way of cultivation. In those orchards where strawberries or other crops have been grown between the trees the tramping by the feet of the pickers has compacted the soil to a very injurious extent. No time should be lost in loosening this with hoe or cultivator. This will assist to conserve to the trees the scanty moisture yet remaining in the ground.

The irrigating of fruit trees is an important part of the orchard work at this season. In applying water, no matter what system is adopted, we should always remember the object is to place the water down into the soil occupied by the roots of the trees. Surface-flooding not only does not do this effectively in the average soil, but it tends to rapidly injure the physical texture of the ground, no matter how carefully it may be after-worked. Let the water flow into furrows or rings of a depth to be determined by the character of the land, and then soak into the subsoil as deeply and consistently as possible. When sufficiently dried to be workable break up the furrows or rings thoroughly prior to working back the general surface into its ordinary position.

The "budding" of trees will be undertaken now, but beginners should not excite the buds into active growth at this late period. The sap must be in active flow to enable this work to be carried out expeditiously and with certainty

of success. If the operator is skilled he will cut the bud shields so that it merely contains a very thin layer of almost transparent cellular tissue. There is no need to remove this prior to inserting the bud. The tying, though simple, is important. The degree of pressure necessary to the proper adjustment of the sap layers of bud and stock can only be found by actual practice. About a fortnight after they are inserted the buds should be examined, and those which have "taken"—indicated by the generally live appearance of the bud and accompanying shield of bark, as well as the easy separation of the leaf stalk carried thereon—should have their bindings slightly loosened. If the loosening be carried to excess the bud may not have united sufficiently to the sap layer of the stock, and then the air will enter and destroy it. To avoid the starting of the bud, refrain from reducing the part of the stock above it until the winter pruning season arrives. A few weeks later the "ties" may be loosened again, or in some cases removed absolutely.

The time for summer pruning apple and pear fruits will arrive in advanced districts at the end of this month. I refer to the partial fracturing of the shoots. This is applied when the period of active growth has reached its turning point. In plain language it is done when the points of the shoots have reached a fibrous condition and no longer snap off when bent. It is applied to lateral shoots only, and then more particularly to the inner shoots of rank growing trees. The lateral is broken so that it hangs by a thin strip of cambium and bark only. The stub usually carries from one to three buds. If one could hit the exact stage of vegetation in the tree no doubt the upper part of the lateral could be broken off completely, but such "absolutisms" are not an attribute of ordinary minds. The winter pruning is reduced by this work, as the hanging portions are then usually dead, and are removed readily. Let it not be understood that the short stubs will immediately produce fruiting spurs, but the foundation is laid and the systematic formation of what will be sturdy bearing wood begun from the main arms upwards. Some writers advise removing the laterals completely from half an inch above its base, and this in November. I would particularly warn beginners to accept such advice with great caution. Without good cultivation to retain natural moisture or irrigation the growth slackens down or ceases early in summer. Under such conditions only short growths may arise from the buds upon the base of the stub. On the average soils of South Australia, however, my observations lead to the opinion that apple and pear laterals under such treatment respond almost as vigorously as when pruned in the winter. This necessitates additional cuttings or fractures, and consequently increases the work. The amateur who plays at fruit growing may do such things, but the average professional gardener does not appear to afford the time for even one fracturing.

Peach trees that are very dense should have a fair proportion of the shoots removed absolutely. Anything short of this will only result in the production of spindly unripened twigs, or an increased number of rank shoots, just as the season is late or early. If careful disbudding and the removal of barren or partly barren wood has been carried out in proper season, there will be little need for the work indicated above.

The early kinds of pears and apples will be harvested, and care should be taken to exclude all of those showing signs of codlin moth burrowings. Orchardists residing in clean gardens or districts should insist on all returned cases being disinfected prior to leaving the markets or factories. Cases sent out for apricots may carry caterpillars in their crevices which have rested there since last autumn. The examining of the bandages should be attended to each week with scrupulous care from this onwards. Infested fruits should be knocked off or gathered if fallen as often as possible, and immediately crushed or boiled.

Spraying with Paris green or arsenate of soda should be continued on late ripening kinds for the destruction of this pest.

Scale insects are now breeding freely, and sprayings with resin wash will prove more effective now than if given in winter or spring. Prior to such sprayings being given the trees should have received a good supply of water at the roots, otherwise damage to the foliage may accrue.

NOTES ON VEGETABLE-GROWING FOR JANUARY.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

Excepting in the deep damp gullies in the ranges, vegetable growing is practically confined to those of a strictly summer-loving character. Now that the tomato plants have set a good few fruits water and liquid manure can be applied plentifully with satisfactory results. These plants respond to a good sprinkling of superphosphate spread over a broken surface and washed into the soil. If grown too extensively to make staking practicable all irrigation furrows should be made on the side opposite to that covered by the bulk of the sprawling foliage. This averts to a certain extent wetting the fruits, and causing rotting and loss.

The members of the melon tribe are now pushing out runners freely. The soil to be covered by the runners should be stirred up and loosened finally before the runners spread far. Long runners may be securely placed in regular positions by setting a clod upon each one. Most melons are grown under irrigation here, and at the running stage an ounce or two of superphosphate washed into the soil around each plant, or clump of plants, yields good results. All growing crops of beans should receive abundance of water now, and the pods should be collected with scrupulous regularity. Although these plants relish loosely tilled soil care must be taken to avoid hoeing or forking too near to their scanty root systems. It is better to mulch around the plant stems with manure or litter and confine the hoeing and watering channels to some 6in. or 8in. away. Successional sowings should be continued every three or four weeks to maintain a regular production of pods.

The soil should be kept loose around all growing crops, and root crops such as beet, carrot, and parsnip suffer considerably if this is omitted. The beets are excellent summer vegetables where water can be supplied to them. The silver beet yields in its stalks and leaves a good substitute for spinach, and the red beet provides in its roots a most wholesome salad. A few plants of the former, if well manured and watered, will supply a household throughout the summer. The latter if sown in small patches at intervals of every three or four weeks will, if watered frequently, yield very satisfactory returns for the trouble.

Beds of asparagus and rhubarb on the plains will be benefited by a good watering occasionally while the tops are green.

Preparations will be made for raising young plants for setting out in autumn. Sunken pits filled to within 2in. or 3in. of the ground level with good composted soil and covered with a calico shade makes excellent seed beds. Paling or board sides, 8in. high, preserve the sides sufficiently. Cabbage, cauliflower, onion, celery, kohlrabi, and lettuce may be sown. The surface of such a pit should be made perfectly level to prevent the water washing the soil and seeds into the lower portions. When the seeds are sown upon the well moistened soil, they should be covered with a sprinkling of finely pulverised manure. Except in very early localities such sowings will not be made until towards the end of the month.

NITRATE OF SODA FOR MARKET GARDEN CROPS AND LUCERN.

In the July issue of the *Journal of Agriculture* an article on the use of nitrate of soda was published, and reference made to the experiments being carried out by Dr. Bernard Dyer and Mr. F. W. E. Shrivell, F.L.S., at Hadlow, England. The *Agricultural Gazette* (England) contains some further interesting particulars concerning the work being carried on at Hadlow.

The experiments were originated for the purpose of ascertaining to what extent nitrate of soda might be profitably used in English market gardening, but their scope is modified in such a way as to include a much larger search for information than this. Broadly speaking, the questions investigated in connection with each fruit or vegetable crop annually cultivated at the station involve a comparison of heavy dunging, with, on the one hand, light dunging without the aid of artificial fertilisers, and, on the other hand, with light dunging with the aid of such fertilisers. Thus, on each section there is one plot heavily manured (50 loads per acre) with London dung, and one manured with half that quantity (25 loads per acre) of London dung, without artificial fertilisers. Then there are three other plots also manured with the lighter dressing (25 loads per acre) of London dung, with the addition of an abundant supply of phosphates and three different quantities of nitrate of soda—either 1cwt., 2cwts., and 4cwts. per acre respectively, or 2cwts., 4cwts., and 6cwts. per acre, according to circumstances. There is also a sixth plot on each section, which never receives any dung at all, but is treated entirely with artificial fertilisers, including from 4cwts. to 8cwts., according to circumstances, of nitrate of soda per acre. All the plots on which phosphates and nitrate of soda are used, whether with or without dung, are further subdivided into two, one-half receiving a dressing of potash salts, the other half being undressed with potash.

Summarising roughly the results of the eight years' work thus far carried on, it may be said that Mr. Shrivell and Dr. Dyer have both come to the very clear conclusion that market gardeners who place their main reliance upon purchased dung not only incur an unnecessary and extravagant expenditure, but fail to obtain from their land by any means its maximum produce. It should be said, however, that for many crops the value of a moderate quantity of dung has been amply demonstrated, but mainly, as the experimenters believe, in virtue of its physical and mechanical properties. The benefit of these, however, can be sufficiently obtained by the use of much smaller quantities of purchased dung than market gardeners ordinarily buy, while the balance, spent in phosphates, nitrate of soda, and (for many crops) potash salts, will produce far larger crops than can be produced by heavy dunging alone. These remarks chiefly apply to crops, the wellbeing of which is largely dependent upon a moist condition of the soil during the spring and earlier summer months. Lettuces, strawberries, onions, potatoes, parsnips, celery, and carrots, for instance, all appear to grow best on ground which is dunged either for the present or for the preceding crop. Many of the cabbage tribe of crops, such as cabbages, cauliflowers, Brussels sprouts, and the like, appear to be more economically grown by the aid of artificial fertilisers only, without the use of dung. This is shown even on the plots which have received no dung whatever for at least nine years, and it would therefore seem to be a very certain conclusion that, on ordinary market gardening land, which is moderately dunged from time to time, it is sheer waste of money to buy dung for these cruciferous crops, when chemical fertilisers may be purchased at their present cheap rates. It was mentioned by Dr. Dyer, as a striking example of this, that

in the case of last year's crop of cauliflowers the plot manured with 50 loads of London dung, at a cost of £10 per acre, produced only 16½ tons of cauliflowers per acre; whereas the plot next to it, manured with phosphates, sulphate of potash, and 8cwts. of nitrate of soda, at a cost of a little over £5 per acre, produced 25½ tons of cauliflowers per acre.

All the crops growing at the time of a recent visit were in excellent condition, the influence of the nitrogenous manure on the color, size, and general luxuriance of the vegetation being in most cases very manifest. It was pointed out to the visitors that on the plots manured with dung alone the produce, generally speaking, was tougher and less crisp than on the plots on which growth had been rapidly advanced by the use of nitrate and phosphates, there being apparently a less development of fibrous tissue and a greater development of soft or parenchymatous tissue. This was very obvious in all the "Brassicaceæ," and it has also been noticed to be a feature in the case of the rhubarb and asparagus crops.

Attention has previously been directed to the lucern plots, of which an account was given by Dr. Dyer last Summer in the *Journal of the Royal Agricultural Society*. These plots, four in number, are still in excellent condition, and have already yielded three cuttings this year, a fourth crop being very nearly ready to cut. These four plots of lucern each receive an annual dressing of phosphates and sulphate of potash. One receives no nitrogenous manure, while the other three get respectively 1cwt., 2cwts., and 4cwts. of nitrate of soda per acre. The effect of the nitrate has been throughout most striking, and was clearly apparent to the eye even in the fourth crop of the present year. Last year the plot without nitrate yielded about 11½ tons of green lucern per acre. The use of 1cwt. of nitrate per acre increased this yield to 15½ tons per acre, while the use of 2cwts. of nitrate per acre increased it to over 17 tons per acre. So far the use of more than 2cwts. of nitrate per acre does not seem to be beneficial. These plots have attracted much attention from visitors during the last few seasons, on account of the fact that they have consistently demonstrated that lucern, although belonging to a natural order of plants not popularly supposed to be benefited by the application of nitrogenous manures, is obviously exceedingly grateful for manurial nitrogen, even in the direct and concentrated form of nitrate of soda. Leguminous plants, although capable of gathering nitrogen from the air, do, as a matter of fact, take up large quantities of nitrates from the soil, as has been amply demonstrated by the Rothamsted experiments; but it probably is not generally realised to what extent their practical gratitude for artificial nitrogenous food is capable of going, at any rate in the case of lucern. French beans, an important market garden crop, have also been demonstrated at Hadlow, both last year and during the past season, to be particularly grateful for nitrogenous manure; and the same thing, though to a less extent, applies to garden peas, though both these crops again, are, according to much modern teaching, supposed to be able to dispense with such aids to growth.

It is to be observed that the dung used in all these experiments is London stable dung, such as is ordinarily purchased and used by market gardeners, not cake-fed farmyard manure.

WHEN TO HARVEST WHEAT FOR SEED.—At the Ontario Agricultural College, in order to ascertain the influence of cutting wheat at different stages of maturity upon the quality of the grain for seed purposes, samples were taken from the crop cut at different dates, and these were carefully sown in separate plots. In the five years' average of results with two different wheats it was found that the heaviest weight of grain per measured bushel and the largest yield of grain and straw per acre were produced from seed taken from the crop which had been allowed to become very ripe before being cut.

FARM HINTS FOR JANUARY.

BY THE EDITOR.

Wise men profit from experience, but there are some people who speedily forget the lessons inculcated by adversity if they happen on one or two fair seasons. Injury from red rust is preventable, because there are several varieties of wheat that are strongly resistant to the attacks of that disease, and some that apparently are rust-proof. These varieties are hardy, rust-proof, and of good milling quality, whilst some are even of superior quality. Farrar, Marshall, and others have devoted much attention to the discovery, development, and "breeding" of rust-resistant varieties of wheat, and our wise farmers should take careful note of what has been done and is being done.

Manitoba wheat is not a sort that would commend itself to the eye of a farmer or an ordinary miller in South Australia. It is a miserable dark-skinned, shrivelled variety, but it contains a greater quantity and better quality of gluten than most of our large-berried, soft, white grained sorts of which our farmers are so proud. We have lost our reputation of producing the best wheat in the world, but still retain that of growing a fine white-flour yielding grain. If we can grow a variety that yields quite as large a quantity per acre of wheat that gives a much better quality of flour—though not so white—that is quite resistant to red rust, stands well, holds its grain, is heat and cold resistant, is it worth while to continue the growing of the old varieties? It is claimed that some of the new crossbred wheats are soft, rust-resistant, hardy, stiff-strawed, prolific, grain-holding, and of even higher and better gluten percentage and quality than that of Manitoba wheat. If those claims can be supported, then we should grow those sorts almost exclusively; but, supposing that those claims are not borne out in practice, should we not seriously consider whether it will be profitable to grow the Manitoba and other flinty wheats.

Straw loses nutritive value gradually for every day it is left exposed. It is richest at the time when the grain is in the dough. If left on the field for months and then harrowed or raked up with clods and stones it is scarcely worth the haulage for any purpose.

Straw from sheaved wheat possesses greater nutritive value than some sorts of wild oat hay. Food of every kind needs bulk as well as quality. Therefore good new straw, if it has been soaked or steamed, is excellent for mixing with oilcake, or molasses, or other highly concentrated foods. Chaffed and placed in alternate layers one foot thick with any very succulent herbage—such as leaves of kail, cabbage, or mangolds in the silo, it makes a most attractive and nutritive sandwich for all kinds of live stock.

All kinds of millets, sorghums, and maize are in the best condition for ensilage when the grain is half ripe or glazed. Where there is rich damp soil or facilities for watering, seeds of maize, sorghum, &c., may be sown now.

On any soils except those that are dense clay, &c., where the crop has been cut with the binder or mower, it will be advantageous to scarify or harrow in about 2lbs. of white mustard and 1lb. of rape per acre on a few acres. These and other seeds will probably start with the first rains, and will furnish at least a little—and may be a lot—of nice, fresh, early green feed at a time when such feed is mostly wanted. Many thoughtful farmers have done this in previous seasons, and have been much pleased with the result.

All summer and autumn fodder crops must be grown in drills or rows, so that the cultivating implements can be regularly used whilst growth is going on. This work is necessary, not so much for destroying weeds as for conserving the

moisture, promoting absorption of moisture from the air, and allowing the air to get into the soil. But the loosened surface must not be coarse and cloddy. It must be like sand, but not necessarily pulverised like dust.

Kail, cabbage, and similar crops will benefit greatly from applications of weak liquid manure near the roots. It is best applied in channels which should be filled in with loose earth after application.

One good heavy shower falling upon an unthatched stack will probably involve several days' labor in taking down, drying, and restacking it, and its value will be diminished. Trust in Providence, but keep your stacks dry.

If all the plants on the pasture are fed down so closely that they cannot produce seed, there will be a serious falling off in the number of varieties next year. Many of our best herbs and grasses are annuals, and sheep and cattle will always eat the best, so that in time none but the worst weeds will be left. For this reason, some portion of each 100 acres—preferably the centre—should be left untouched by stock until all the grasses and best plants have ripened and dropped their seeds.

Farmyard manure deteriorates in value for every day it is kept exposed. The volatile matter that escapes on the air, and the soluble portion that is leached by rain, as well as the liquids that naturally drain away, are all of great value as plant food. Dry soil, or pulverised or calcined gypsum will prevent much of the waste; but the sooner farmyard manure is worked into the soil the better. It is the natural capital of the farm, and should be made to return interest at once, instead of lying uninvested and idle in the manure-bank.

KANSAS AND HER WHEAT.

South Australia produced last year about thirteen millions of bushels of wheat. The single State of Kansas during that year reaped 77,339,091 bush., nearly six times as much as South Australia, and nearly twice as much as the whole of Australia. The area under wheat in Kansas last year was 4,378,533 acres, and the average yield about 18 bush. These figures form a striking contrast to our South Australian yields.

The following table shows the acres, product and value of Kansas winter and spring wheat for the last ten years:—

Years.	Acres.	Product.	Value.
			£
1891.....	3,733,910	58,550,653	42,596,759·09
1892.....	4,129,829	74,538,906	40,691,762·03
1893.....	5,110,873	24,827,523	11,052,932·04
1894.....	4,840,892	28,205,700	11,297,797·13
1895.....	4,171,971	16,001,060	7,463,118·47
1896.....	3,357,727	27,754,888	13,257,193·77
1897.....	3,444,364	51,026,604	34,385,304·69
1898.....	4,624,731	60,790,661	32,937,042·28
1899.....	4,988,952	43,687,013	22,406,410·00
1900.....	4,378,533	77,339,091	41,974,145·00

Forty years ago the Kansas area sown to wheat of all kinds, winter and spring, hard, medium and soft, white, and otherwise, was less than 10,000 acres. For ten years ending with 1900, the average has been 4,278,178 acres, and the yield per year, counting the good with the bad, was more than 46,272,000 bush., while in the year 1901 there will be harvested approximately 5,000,000 acres of winter wheat alone, yielding generously grain grading for

quality as high on the whole as any preceding crop grown. The largest area previously sown to winter wheat was 4,909,972 acres, from which the crop of 1893 was harvested, and the States largest wheat product was 77,339,091 bush. in the year 1900. (The United States agricultural report says the yield was 82,488,655 bush.)

Notwithstanding these wonderful aggregate outputs, the wheat crop in Kansas is subject to vicissitudes, as it is elsewhere—though possibly to a less degree—as is readily suggested by the variation of the average per acre yield from less than 4 bush. in 1895 to more than 22½ bush. in 1882. In thirty of the thirty-nine years for which definite figures are available, the average yield for all the acres sown was about 10 bush. per acre, and for fifteen years has been 15 bush. and above.

Kansas is virtually the only portion of America producing the famous hard red wheat in considerable quantities, in which, as in many other things the State is unique. The seed of this wheat was introduced about twenty-five years ago, being brought hither by Mennonite immigrants coming from Southern Russia near the Black Sea, who, apparently, understood much better than the Americans its hardy productiveness and real value. For years following its introduction it was disparaged by American millers and grain-buyers, who claimed that its flinty character made it so difficult to grind as to materially lessen its market value. The farmers, however, persevered in sowing it and the production steadily increased, although they were compelled to accept in the markets from 10 cents to 15 cents per bushel below what buyers and millers were willing to pay for the softer and much better known varieties which yielded considerably fewer bushels per acre. They persistently argued that it was more profitable to raise a wheat that would reliably yield them, one year with another, from 18 bush. to 40 bush. per acre, even though selling for but 70 cents per bushel, than to raise a crop selling for 80 cents or 85 cents per bushel, and yielding perhaps only 12 bush. to 15 bush. This, in the course of a few years, compelled millers to devise ways and means for more successfully and economically converting this hard wheat into flour, and there were brought into use processes for softening the grain by steaming and moistening before grinding; these are now in general use and are considered indispensable wherever wheats of this class are floured. This has required a general remodelling of such mills as were already built, and the construction of the later mills on plans in some respects entirely different from the old, and now, out of all this, results the Kansas hard wheat flour, which have become famous in the world's most exacting markets as superior to nearly all others wherever made in America, and are considered equal to the flours made in Hungary from wheats grown in that country and in Bohemia. This is true either for use alone or for blending with and giving quality to other pretentious makes represented as peculiarly choice because made from extra fancy grades of spring wheat grown elsewhere.

These wheats do not retain their peculiar characteristics so well when grown in the extreme eastern and south-eastern counties, showing a tendency to assume more the qualities of soft wheat, and this is true, but to a much less extent elsewhere, wherever they are grown in Kansas. This fact has for some time suggested the desirability of procuring fresh seed from time to time from its original home in Russia, and for a year past a concerted movement of the Kansas grain and milling interests has been carried on for importing direct a ship's cargo of seed in time for distribution among Kansas farmers for the present season's sowing. This imported seed, intended to be as perfect as money could buy, is due to arrive at an early date, and will be on general sale, though it is being imported particularly for those who gave their orders in advance for the quantities needed by themselves.

Probably the average quantity of seed used per acre by the Kansas wheat-sower is five pecks, and this varies according to quality, location, method and time of seeding, and the whim of the sower, from a minimum of three to a maximum of six pecks. Perhaps nine-tenths of the area is planted with drills, the old style of sowing broadcast being discarded. Not all of the wheat land is ploughed every year, it being very common, especially in the western half of the state to drill directly among the stubble of the recently harvested grain; it is claimed that this gives a firmer seed-bed, with much less danger of the surface soil being moved about by the high winds, and of leaving the roots naked to the weather. Much of the ground, however, that is not ploughed is scarified with disc harrows before seeding, and a very satisfactory condition is obtained thereby. Rotation is something to which the Kansas farmer has as yet given little thought, but his methods will change with years.

FOREST PLANTING AND TIMBER SUPPLY.

BY F. E. H. W. KRICHAUFF.

No. 3.—Private Planting in the United States and German Model. Forestry in New Zealand and Export. Australian Imports of Timber.

Contrary to the general rule in other countries practical forestry began in the United States first on private land. General Bidwell planted as early as 1856 at his Rancho Chico, now a forest sub-station in California. Mr. G. W. Vanderbilt began at Biltmore in 1892, with a systematic forest management, steadily and successfully. Since 1898 up to January, 1900, private persons owning more than 2,000,000 acres have obtained assistance from the Forest Department with a view to bring about the substitution of conservative for destructive methods by means of working plans, also full directions and advice on the ground, how to work their forests. Tree forestry is chiefly carried on by persons having comparatively small holdings; so in Massachusetts a large number of farmers have from one to ten acres under forest trees, and these should here also be encouraged to plant.

Professor Graves reports on a very interesting plantation made by Mr. L. Allen, at Smithfield, R.T., who sowed chestnuts, oak, hickory and locust in ploughed furrows on forty acres of waste land, using only a hoe in rough places. He kept a careful account of expenditure and receipts, and at the end of fifty-seven years the books showed a yearly profit of 6.92 per cent. on the capital invested. In Massachusetts the Forest Association records the planting of 10,000 acres with pitch pine, oak, ash, &c. The seeds were sown with a machine, or by hand in ploughed furrows, about 4ft. apart, at a cost of 12s. to £1 per acre. A Mr J. D. Lyman, near Exeter, N.H., also showed that he was able to stock land with trees at the same cost per acre by sowing the seeds in hills 4ft. apart, putting three to four seeds into each. In the Girard estate the cost of planting varied on the other hand from £3 12s per acre for pines to £15 for oaks. The more intelligent farmers trim their trees to 6ft. or 8ft., except those on the outside of the plantation which form a protection against wind. Tops, brush, &c., and such trees as are old, dead, or unshapely, are thinned out, and what cannot be used or sold are burned in winter, and the ashes spread among the growing trees. For the production of firewood they cut hardwood close to the ground and slanting from the centre before the sap begins to run in spring, so as to make the stump send up sprouts, which are thus pretty safe from windbreak. The washings of the banks of creeks have

been frequently prevented by the planting of birches and willows with seedlings two years old. In parts east of the Mississippi worn-out lands are seeded with pine, and when the trees are thirty to fifty years old, the land is again cleared and cultivated.

The States Iowa, Kansas, Wisconsin, Nebraska, Missouri, Minnesota, Nevada, Illinois, and Dakota encouraged tree-planting already twenty-five to thirty years ago by bounty, or exemption from taxation. Thus the State Board of Kansas had in 1898 already 159,859 acres planted, and some of the railway companies have planted three millions of trees. As early as 1874 it was estimated that there were about one million of eucalyptus trees planted in California. And these States have acted none too early. One result of the damage done by the destruction of forests mentioned by Mr. Egglestone may here be mentioned in place of ever so many similar ones. It states in a conspicuous manner the great and direct damage resulting from extensive cuttings in the Sierra Nevada. Every condition of soil and climate was there favorable to the growth of forest trees in perpetuity. But thousands of axemen cut down all trees as the easiest way of getting the largest trunks out for the use of the mines, and what yet remained of trees, spread over ever so many miles of the mountain sides, was destroyed by fire, which burned also the soil beneath the trees and the rich leafmould, the accumulation of centuries, while the rocks crumbled to gravel. Then the rain swept away the ashes, any soil yet left, and the gravel down the mountain side, and covered up the fertile meadows at the foot to the depth of many feet. The settlers soon found themselves at the mercy of torrents in the spring and droughts in the summer, and were forced to abandon their once most productive farms. It will take centuries to again clothe the mountain with trees, perhaps never again thick and stalwart as before, and the plain below may almost remain a desert.

From the foregoing we see that after all private persons and companies have planted fairly large areas, but infinitely too small, if we consider actual demands at home and from abroad. There is, however, the hope that the Cornell University will soon bring about a different system of forest management conducted on permanent principles. Since 1898 a four years' course for young foresters upon German lines has been modelled; 30,000 acres in the Adirondack Mountains are used for practical operations, and after examination degrees are to be given. For in Germany forestry has in the course of centuries become an art, and the difference in climate in the eastern States is apparently not very great. For other States the young foresters must adopt a course of action to which their studies should have fitted them. In Germany the most active endeavors are made at great expense to raise forests on the heathlands of Hanover, and also again on those in the centre of Schleswig-Holstein—which had been depleted centuries ago by furnishing the oaks upon which the fine city of Amsterdam has been built—to assist growth by fertilisers. Personal greed cannot altogether be prevented from recklessly destroying any private forests, but the Administration of Forests in Prussia gives a bonus of 10s. an acre to municipalities and private persons who plant largely. From the 1st day of July, 1900, to the 31st March, 1901, they distributed also 17,977,300 fine forest trees to all persons or communities at the cost of raising them where the trees could not be raised so cheaply and well. The German Government knows well the value of the State forests from the millions they send to the Treasury and cherishes them as among their most precious possessions. Their maintenance and renewal is reduced to a science taught at many forest schools, and the management constitutes one of the most important departments of State. Some years ago 11,250,000 acres of forest were the property of the State (now considerably more in course of afforestation), and 34,750,000 acres were owned privately. A term of eighty years was allowed before the cutting

of pines and beeches from medium soil, and a yearly revenue from 3 to 5 per cent. on the value of the soil is expected. Oaks may require from 120 to 160 years, but the value of such timber is constantly rising, and the western countries of Europe require all that can be possibly spared. Dr. Brandis, when Inspector-General of Forests in India, said that "the practice of German foresters of all grades is as good if not better than their theory. Every branch of the subject, resulting in hundreds of thousands of acres mapped, divided into periods and blocks, and worked to the best advantage both with respect to present and future and the annual yield of which now and for many years to come, is known and fixed to within a few hundred cubic feet. For a model we have to look to Germany." For it must be remembered that the culture of forest trees entails a "rotation" plan extending from forty to eighty years and more; any "break" of the plan must overthrow it. Unless placed at the outset upon a solid and permanent basis no practical good can result. That lands once reserved for forests should not be given up to agriculture or horticulture—although this eminent genius caused bogs to be laid dry and forests to be cut down where he deemed this wise—Carolus Magnus, German Emperor (768-814) ordered already "that the forests shall be taken care off, and that any officers give no permission to cut too much, or devastate them," but only towards the middle of the eighteenth century, when timber began to get scarce, was fore-try taught in special schools, first in Berlin, 1772 in Wernigerode, 1783 in Hohenheim, 1785 in Kiel, &c. Since Frederick the Great commanded the villagers to plant the white mulberry to enable them to raise silkworms, many commenced also to plant forest trees on the commons, and during the last decennial these forests give frequently such profits that, instead of paying rates, there is sometimes a divisible profit amongst the fortunate ratepayers, similar to where roads or commons have been planted with fruit trees. It is, however, to be regretted that private owners, especially in Bavaria, are cutting so many of their forests, so that during 1897, 1898, and 1899 no less than 15,459 more acres were cut down than planted in the said kingdom. The following resolutions were, therefore, unanimously passed in February, 1901, at the Royal Land Oeconomie Collegium of Prussia, at which the Emperor sometimes attends, viz.:—"To request the Minister of Agriculture to prevent the destruction of forests with all force and more means," and also to ask him to call together a conference of members of provincial administration and of agricultural chambers with a view of systematically regulating the use of public moneys for the support of forests and the planting of waste lands with due regard to provincial circumstances." It was also mentioned that every owner of forests should be compelled to plant as large an area as he may clear of forest trees; but the President, Count Bernstorff, warned them not to interfere too much with the rights of owners, and rather to obtain the consent of the provinces to enlarge their forests. Notwithstanding that Germany had 25 per cent. of its area in 1890 under forests, no less than £4,500,000 worth of timber was then imported. Of course much of its own timber is exported, especially to Holland, and wooden wares for about one-half the above sum are also exported. Still the imports exceed the exports for a large sum, and lands once reserved for forests should not be given up to agriculture or horticulture, neither there nor elsewhere, unless such lands have proved useless for the growth of forest trees. In fact the advice given in a report written a few years ago by the late Conservator of Forests of Victoria, Mr. Geo. S. Perrin, F.L.S., F.R.G.S., to the New Zealand Government, is well worthy of repeating here:—"I feel bound once more to warn the Government that if forestry operations—of such vital and momentous importance—are not placed at the outset upon a solid and permanent basis no

practical good can result. Systematic and scientific treatment has been proved and recognised as indispensable. Such treatment cannot be applied if the system is disarranged merely to oblige Jack, Tom, or Dick, who supposes that an elector's or miner's right gives him authority to burn, cut, or otherwise destroy timber at his own sweet will, and without any reference to the rights of the people as a whole, who really own the forest. If these suggestions are taken up in a large-hearted, vigorous fashion, determined that there should be no faltering or turning back, then I am certain New Zealand will find her forests a blessing and the means of employment for thousands." And what were these suggestions, of which I will mention a few?—1. Permanent and inalienable existing reserves, with power to reserve others; management from a scientific and national standpoint without political interference. 2. No new settlement within the area of State forests, and, where such have been established, the settlers should be bought out. 3. State forests should be of large area, as less expensive to supervise. 4. Conservator to be a trained expert. 5. A Forest Board of three Commissioners, with the Conservator as chairman; to be non-political, meeting once a month, and acting as a buffer between the latter and the Minister to secure ample powers for an uninterrupted and continuous progress of the work intrusted to him.

New Zealand meanwhile lives upon its tree capital, employing at 443 saw-mills constantly 5,466 persons, irrespective of the men engaged in felling, logging, and hauling. The reserves on March 31st, 1896, were 1,150,918 acres; and in 1898 no less than 40,721,632ft. (mostly kauri) were exported at a value of £161,723, while 9,905 tons of gum had a value of £586,767. The Timber Export Bill, which passed lately the second reading by a large majority, will also increase for us the cost of timber from there (irrespective of *our* duty), for the export duty will be 3s. per 100 superficial feet in logs and a higher duty upon half-logs. And with such a revenue from its natural forests New Zealand is not yet entering upon forestry in real earnest. The Registrar-General, von Dadelszess, at all events, says in the Official Year-book of 1900:—"A day of retribution will most assuredly overtake New Zealand for the persistent neglect to plant trees to compensate in some degree for the wholesale denudation of our native forests. In Canterbury especially the work has been grossly neglected. The Government are, however, taking some steps to remedy the evil, and it is hoped that private enterprise will follow the good example. It is sad to reflect that long before the close of this century there will be a dearth of timber throughout New Zealand."

In giving a return of Australian imports and exports of timber during the years 1898, 1899, and 1900, I should have liked to have been able to state with anything like accuracy the number of cars required for distribution of the imports. The mere thousands or millions of feet do not give us such an idea of the enormity of our wants. With such a view has Professor Sargent, of the United States, estimated in 1886 that they consumed of sawn lumber alone 36,000,000,000 square or superficial feet, which would be sufficient to load a train of cars and encircle the earth at the equator; and, if you added railway sleepers, poles, posts, and the wood cut for mining purposes, such train would have to be 100,000 miles in length, reaching four times around the globe, or it would be loading for 480,000 ships of 1,000 tons each.

In looking over the statistics of South Australia, it was no surprise to me to observe how little timber, the produce of this State, has been exported. In 1898, 6 spars, 1,000 laths and 1,688 felloes are mentioned; in 1899, 250 lineal feet of architraves, 1,701 sleepers, 2,517 sleepers, and 96 mixed loads; in 1900, 96 spokes, 486 felloes, and 2,404 mixed loads were exported against the imports and total exports mentioned hereunder.

Imports of Timber into South Australia.

	1898.		1899.		1900.		Total.
		£		£		£	£
Architraves (lin. ft.)	505	3	33,095	140	15,864	69	212
Boards (sup. ft.) ..	6,899,904	42,887	5,067,800	34,345	8,993,030	57,130	134,362
Deals and Battens (loads)	14,204	37,985	8,845	21,999	10,557	32,029	92,013
Laths (number) ..	1,582,970	1,373	621,000	568	1,442,500	1,322	3,263
Palings (number) ..	1,172,320	4,835	987,000	4,384	1,180,320	5,146	5,000
Shingles (number)	4,000	4	—	—	—	—	4
Sleepers (number)	2,000	220	34,564	5,049	39,509	3,841	9,110
Spars & Quarterings (loads)	30,440	65,298	27,984	74,323	42,418	90,145	229,766
Spokes in the rough	39,420	263	61,640	481	13,600	109	853
Staves in the rough	229,356	5,537	232,373	6,244	179,329	4,623	16,404
Unenumerated	—	633	—	1,254	—	576	2,463
Other loads	21,996	42,602	31,889	62,571	35,566	74,379	179,552
Total	—	£201,640	—	£211,358	—	£269,369	£682,367
Deduct exports	—	—	—	—	—	—	191,890

Value of imports for three years for use in South Australia £490,477

Exports of Timber from South Australia.

	1898.		1899.		1900.		Total.
		£		£		£	£
Architraves (lin. ft.)	709	5	528	33	19,514	118	156
Boards (sup. ft.) ..	692,839	6,109	744,490	6,375	1,306,650	11,869	24,353
Deals and Battens (loads)	525	1,830	344	1,108	525	2,424	5,362
Laths (number) ..	129,980	90	55,800	71	70,000	78	239
Palings (number) ..	3,400	23	36,600	178	5,000	32	233
Sleepers (number)	—	—	35,717	5,872	26,211	2,101	7,973
Spars & Quarterings (loads)	25,763	56,458	14,683	24,933	13,659	20,160	101,555
Spokes in the rough	—	—	—	—	96	8	8
Staves in the rough	—	—	25	1	300	7	8
Other loads	85	367	8,395	26,779	16,063	30,635	51,781
Felloes	1,688	73	2,517	125	486	24	222
Total	—	£64,955	—	£59,477	—	£67,458	£191,890

For the other Australian States I can only give the value of the imports and exports for the year 1900, viz. :—

	Imports.	Exports.
	£	£
New South Wales	547,520	139,723
Victoria	569,173	36,495
Queensland	26,332	18,106
Western Australia	55,884	458,863
Tasmania	23,247	42,005
South Australia	269,884*	67,426
Total	£1,782,014	£762,618

* or £269,369 (?)

It is very necessary to understand that the apparently large export is mostly from State to State. Western Australia did send for £110,000 to other States, and Tasmania for £19,242. The value of Western Australia's export beyond Australia was £347,800—clearly living at an enormous rate upon forest capital! And South Australia required for its own use for 1898, 1899, and 1900, nearly half a million's worth of timber!

THE COMPLETE HARVESTER.

Since the advent of the seed and fertiliser drill no new agricultural implements have excited so much interest amongst farmers as the complete harvester, which strip, clean, and bag the grain at one operation. When the first machines were tried here a few months since, no provision was made for saving the wheat chaff, and many of our Northern farmers who had had the value of this chaff forcibly impressed on them of late years, found fault with the new machine on that account. The distribution of the seeds of weeds, &c., winnowed out in the cleaning was another objection, but both of these have been overcome by several makers. Many farmers also fear that owing to the machines being much more complicated than the ordinary strippers, there will be more wear and tear and greater expense in keeping them in working order. The manufacturers, however, claim that these fears are groundless. The high price of the machine—up to £90—will doubtless prevent many farmers from purchasing what is undoubtedly the harvesting machine of the future.

During the past six weeks a number of field trials and competitions of these machines have been held in this State, and great interest has been manifested in their operations. The principal trial was held at Smithfield on December 5 under the auspices of the Royal Agricultural and Horticultural Society. A well grown and even crop belonging to Mr. W. Smith was cut up into two and a half acre blocks for the trial. The following table shows the judges' awards. Each judge judged the machines separately; the points were then totalled and averaged and the awards made accordingly—

Scale of Points.	Total Points Obtainable.	Land No. 1. Sunshine.	Land No. 2. Mayflower.	Land No. 3. The Climax.	Land No. 4. The Mitchell.	Land No. 5. Empire No. 1.	Land No. 6. Empire No. 2.	Land No. 7. The Union.	Land No. 8. The Federal.
Clean reaping	75	70.4	67.8	71.0	46.0	66.6	63.6	61.6	69.2
Clean thrashing	75	70.4	69.8	69.6	68.2	66.6	58.8	67.4	68.2
Clean winnowing	75	68.8	58.6	60.2	61.4	65.2	59.4	68.2	66.2
Machine making best marketable sample	50	49.2	39.6	41.0	45.2	47.2	41.4	48.8	47.0
Machine with least grain in chaff	50	46.8	36.6	43.4	38.6	33.0	34.4	46.6	36.2
Machine wasting least chaff	25	20.0	15.6	10.0	10.0	21.4	18.0	18.8	10.0
Simplest and quickest disposal of clean wheat....	25	20.4	20.0	20.4	19.8	15.8	20.0	20.0	20.4
Simplest and quickest disposal of chaff	25	15.0	13.6	10.0	10.0	15.0	16.0	17.6	10.0
Ease of draught	25	25.0	13.0	20.0	15.0	17.0	20.0	20.0	11.0
Machine least liable to get out of order	25	21.6	19.4	20.8	19.2	19.8	17.4	22.6	20.8
Time occupied in reaping and winnowing	25	20.4	19.6	14.2	15.3	14.4	6.4	23.0	17.4
Price of machine	25	16.4	20.4	20.8	18.0	18.0	18.0	17.2	15.4
Total points	600	444.4	394.0	401.4	366.6	400.0	373.4	431.8	391.8

Surprise was expressed in some quarters that machines which made no provision whatever for saving the chaff, but distributed it on the field, were awarded points in the sections "machines wasting least chaff," and "simplest and quickest disposal of chaff." The Union machine finished its work first in one hour fifty minutes, and the Sunshine second. The awards were—Sunshine first and Union second. These two machines were undoubtedly the favorites amongst the spectators, opinions differing as to which did the best work. A protest was entered against the Sunshine harvester early in the day, owing to three men attending the machine instead of two, as provided for in the rules of the trial as drawn up by the Society.

On November 29 a working trial of harvesters was held at Paskeville, under the auspices of the Northern Yorke's Peninsula Bureau Field Trial Society, but no awards were made, each farmer present being left to form his own conclusions from the work done. Five machines—The Union, Sunshine, Federal, Mitchell, and Empire—were shown at work, and great interest was taken by the large gathering of farmers present. The machines were not fitted with appliances for saving the wheat chaff, and came in for adverse criticism on this account; but, as previously stated, this objection has been met by some of the manufacturers. A field trial of these machines was also held at Crystal Brook, but owing to rain falling soon after work was commenced a satisfactory trial was not possible.

In the *New South Wales Agricultural Gazette* for November Dr. Cobb gives some interesting particulars of the giant harvesters at work in California, where the conditions at harvest time are very similar to those prevailing in this State. The machines cost up to £1,600 for the largest steam-traction harvesters. Dr. Cobb states that some of the best of these cut a width of 24ft. to 27ft., and require seven men and boy to run; they consume about two tons of coal per day, and harvest up to eight acres per hour, or 1,000bush. per day, which make the cost of harvesting, cleaning, and bagging about 3d. per bushel, not including cost of bags. Some of the machines are fitted with tires 7ft. wide for work on sandy country, as their great weight causes them to sink deeply. The horse-traction harvesters do not require so many men to attend to them, but usually from twenty to thirty mules or horses are required to draw them. All these harvesters cut the straw to within 8in. to 12in. of the ground, the threshed straw being deposited in heaps in the paddock.

THE DAIRY BOARD.

TUESDAY, DECEMBER 10.

Present—Messrs. R. Caldwell, M.P. (Chairman), J. W. Sandford, J. Legg, A. Lipson, F. Hodby, J. Paris, W. Thyer, and W. L. Summers (Secretary).

Produce Depot.

Members paid a visit of inspection to the Port Adelaide Produce Depot, and, in the absence of the manager, were shown round by the engineer in charge. Members were much pleased with the arrangements of the depot, everything being cleanly and in good order. They were satisfied that the produce was being carefully handled, but regretted to note so little produce being passed through the chambers. Special note was taken of the room set apart for the examination of butter by the Dairy Instructor, and, although some members thought the temperature was allowed to rise too high, it was otherwise considered very suitable.

Annual Report.

The CHAIRMAN reported that he had furnished the Minister with a report on the proceedings of the Board for the year ending June 30, 1901.

Dairy Inspection.

The CHAIRMAN reported having interviewed the Chairman of the Central Board of Health in reference to the inspection of dairies, and that Dr. Smith was quite in agreement with the Board as to the necessity for inspection. The work of their inspector had emphasised the need for the work. Many dairies were carried on under conditions which should not be allowed to exist. The Health Act provided all the machinery required, but as the Central Board was not supplied with funds for the purpose it could not undertake the work of inspection further than it was doing already.

Considerable discussion, mostly of a conversational nature, took place.

MESSRS. SANDFORD and PARIS objected to the appointment of additional inspectors, as that would only mean extra worry and trouble for the dairymen, and the expense would not be justified.

Mr. LIPSON moved—"That the Chairman be deputed to ascertain what arrangements have been made for the inspection of dairies by the Governments of the other States, and report to next meeting of the Board, with the view to recommending to the Minister a scheme of inspection for adoption in this State." This was carried.

The CHAIRMAN expressed surprise at the remarks of Mr. Sandford, as for the past two years the Board had been practically unanimous as to the necessity for such inspection.

WATER IN BUTTER—AN IMPORTANT FEATURE.

By G. S. THOMSON, N.D.D., GOVERNMENT DAIRY INSTRUCTOR.

The above subject is attracting considerable attention in Great Britain at the present time, and before long a standard for moisture will be fixed by a Royal Commission now sitting. With a precautionary measure about to be enforced, it is very gratifying to know that the Australian butter has won the reputation of being free from excess of water, and reports show that the percentages are below those of other leading export countries.

Ireland would appear to favor the manufacture of a moist product, as much as 25 per cent. of water having been found in samples analysed. In Denmark the average exceeds 13 per cent., and in Canada and America the percentages are also high. I am pleased to say that the South Australian butter possesses a remarkably dry texture, and we can attribute this quality to the climate and herbage, which are highly favorable to a solid body in the milk and cream.

In our recently-conducted experiments on the hand-feeding of milking stock, we have an illustration of the freedom of butter from moisture and the presence of high percentages of butter fat in ten samples analysed by Mr. Goyder, F.C.S., School of Mines. These striking results are as follows:—

	Water. Per cent.	Fat. Per cent.		Water. Per cent.	Fat. Per cent.
No. 1	10.54	86.12	No. 6	7.58	89.68
No. 2	10.37	85.69	No. 7	7.26	89.11
No. 3	6.68	90.59	No. 8	8.36	87.68
No. 4	7.07	90.49	No. 9	9.40	88.07
No. 5	7.13	89.27	No. 10	9.06	88.07

In seeking reasons for the above determinations I would refer readers to the *Journal of Agriculture* for July, 1901, where a detailed account is given of the rations fed to cows throughout the experiments, and the weight and quality of milk produced.

Percentages of Water Found in Export Butter.

During the present export season I have analysed over fifty samples, and the average percentage of water is 11·7.

The following is a list of the proportions of water found in twelve consignments of butter shipped from the Government Dépôt on October 17:—

No. 1, 12·1; No. 2, 11·4; No. 3, 14·2; No. 4, 11·2; No. 5, 11·3; No. 6, 11·9; No. 7, 9·9; No. 8, 9·1; No. 9, 9·2; No. 10, 12·1; No. 11, 11·5; No. 12, 11·3.

No. 3 represents a sample of unsalted butter, which will be considered in another part of the paper.

IS THE BUTTER-TRIER RELIABLE IN GIVING A PRACTICAL GUIDE TO
THE EXTENT OF MOISTURE IN BUTTER?

For some time I have regarded the use of the steel trier as unreliable in providing a practical estimation of the extent of moisture in butter, and, after comparing its worth with accurate analytical tests, my suspicion has been justified. In support of my contention we have evidence in the results of important tests published in the Australian States, in which one finds an instance of excessive moisture being confronted with an average percentage of water in a sample of butter examined. In such a case as this the trier had certainly been deceptive, as was proved by the analyses. Further proof was observed in a report issued by a foreign journal, giving the percentages of water in butter from different countries, and it remarked that a sample of dry consistency proved to contain over 13 per cent. of moisture. The same may be said of the Danish butter; and, to show conclusively the weakness of the trier, the following table of practical tests and analyses of South Australian butter is given:—

No. of Sample.	Percentage of Water Found.	Indications of Moisture on Trier.	Consistency or Texture.
1	9·0	Very dry	Greasy, overworked.
2	12·5	Very moist	
3	10·9	Very moist	
4	14·1	Very dry	Greasy, overworked.
5	10·1	Moist	
6	11·0	Moist	
7	11·8	Dry	Greasy, overworked.
8	11·5	Very moist	
9	11·5	Moist	
10	11·4	Dry	Greasy, overworked.
11	11·5	Dry	
12	10·5	Very moist	
13	11·2	Dry	Greasy, overworked.
14	11·3	Dry	
15	10·1	Dry	
16	10·2	Dry	Greasy, overworked.
17	12·2	Very moist	
18	13·2	Dry	
19	11·4	Very moist	Greasy, overworked.
20	12·3	Fairly dry	
21	13·2	Moist	
22	10·4	Dry	Greasy, overworked.
23	10·0	Moist	

Unsalted Butter and the Trier.—In a number of tests of unsalted butter I have always found that the trier showed little indications of moisture, the butter appearing in some instances unusually dry. We have an example of this in No. 4 of the analyses given.

EXPERIMENTS TO DETERMINE THE CAUSES OF VARIATION IN THE PERCENTAGES OF MOISTURE.

A series of tests has been conducted to ascertain the chief causes of variation in the moisture of butter, and I feel satisfied that the results are deserving of careful study by every butter-maker in the State.

The experimental butter, consisting of eighteen boxes, was made at the Wilmington factory by the manager, Mr. Lauterbach, and I can assure readers that every care was taken to carry out each detail in the instructions given.

In taking the samples of butter for analysis all precautions were adopted, and I checked the percentages of water in each case, so that the results can be confidently relied upon.

Test 1.

In test 1 six boxes of butter were manufactured, the main object being to ascertain the effects of temperature and salting on the degree of moisture.

	Box No. 1.	Box No. 2.	Box No. 3.	Box No. 4.	Box No. 5.	Box No. 6.
Temperature—						
Temperature of cream when churned	54° F.	58° F.	56° F.	56° F.	56° F.	56° F.
Acidity of cream	5.8	5.2	5.9	6.9	5.9	5.9
Minutes in churning	24	20	22	23	23	23
First washing, 5galls.	Water	Water	Water	Water	Water	Water
Second washing	Brine	Brine	Water	Water	Brine	Brine
Salting—						
Pounds of salt to 5galls. water....	1	1	—	—	3	5½
Pounds of salt to 100lbs. butter ..	2½	2½	5	2½	<i>Nil</i>	<i>Nil</i>
Preservatives—						
Preservitas, ounces to 100lbs. butter	10	10	10	10	10	10
First working, minutes	1½	1½	1½	1½	1½	1½
Second working, minutes	1½	1½	1½	1½	1½	1½
Time between working, hours	17	17	17	17	17	17
Weight of cream	40	40	40	40	40	40

In the manufacture of the butter great care was taken to secure uniformity in the treatment of the cream and handling throughout, and nothing occurred to interfere with the correctness of the results. In working the samples the speed of the roller was 45 revolutions per minute, and the salt and preservitas where used were added immediately after starting to work the butter the first time. The temperature of the unsalted water for washing the butter grains was at the same degree for each churning.

Water Analyses.

The following are the percentages of water found in the six boxes:—

No. 1, 11.1 per cent.	} Difference due to temperature of cream churned.
No. 2, 12.5 per cent.	
No. 3, 10.5 per cent.	
No. 4, 12.7 per cent.	} Difference due to salting.
No. 5, 13.4 per cent.	
No. 6, 14.6 per cent.	

For convenience in giving an explanation of the above I have divided the large table into three headings, viz., Temperature, Salting, and Preservatives. Let us consider the first two.

Temperature.—In each box of butter, excepting No. 1 and No. 2, the temperature of churning was the same, 56° F. Observe the difference in water percentage of sample No. 2, which was churned at 4° higher temperature than No. 1, other conditions being exactly the same from first to last in making the butter. This is additional evidence that temperature of cream influences the

weight of the butter, and in cases where the temperature is higher the proportion of water will be greater. I firmly believe that cream which has been once overheated will produce a sample of butter poor in texture and keeping qualities, even where refrigeration is adopted in cooling the cream before churning and chilling the water for washing the butter-grains.

Salting.—It is well known to every one of us that the extent of salt added to butter influences the amount of water left in the product. Unsalted butter compared with salted contains a higher percentage of moisture, and this is borne out in the following analyses which I conducted this year. In each case the salted and unsalted butter was made from similar churnings of cream:—

Unsalted Butter.	Salted Butter.
Per cent.	Per cent.
13·2	11·8
14·2	11·4
14·1	12·3

In looking at the analyses of Test 1, No. 3 box gives less water than No. 4. This may be accounted for by the double quantity of salt taking up the moisture better, but by exceeding the 5lbs. a higher percentage than 12·7 would be attained. There is a reason for this peculiarity; we know that unsalted butter is heavily charged with moisture and there must be a stage at which the percentage of salt increases the water. In consequence of this variation, a quantity of butter was made and divided into three lots, one was salted at the rate of 5 per cent., the other 7 per cent., and the third 10 per cent. Each quantity received the same treatment, and upon analysis 5lbs. salt left 15·4 per cent. water in the butter; 7lbs. salt left 17·9 per cent.; 10lbs. salt left 18·8 per cent.

Returning to Nos. 5 and 6 let us see what the brine has done to vary the extent of moisture. An increase of 2½lbs. in the brine in No. 6 has given 1·2 per cent. of extra water. Had more salt been used I believe that a further percentage would have resulted. This test will suffice to demonstrate the important bearing dry salt *v.* brine has on the moisture in butter.

Preservatives will be dealt with under a separate heading.

Test 2.—The Butter Worker.

The treatment of butter on the worker is so important a matter that a saving in money can be made by careful and skilful management. In manipulating the appliance successfully the operator studies the solidity and texture of the butter as soon as the granules are formed in the churn. But this should not be sufficient to satisfy the factory manager; he must take into consideration the temperature of the room, the probable moisture that the butter contains; and both judgment and skill are required to leave a sufficient percentage of water in the manufactured product without causing damage to the fats and keeping properties of the butter. That serious injury results to texture by careless handling of the worker is apparent in the following percentages of greasy and streaky butter that was shipped from South Australia during last export season. (See *Journal of Agriculture*, May, 1901.)

	Greasy.	Streaky.
August	10 per cent.	2 per cent.
September	11 per cent.	8 per cent.
October	5 per cent.	6 per cent.
November	5 per cent.	3 per cent.

In the first pages of this article, dealing with the table of percentages of water in export butter, the reader will observe that a low degree of moisture is accompanied by a greasiness of texture in fine samples. In most cases this defect was found in consignments of milled butter, and it is reasonable to attribute the dryness of the produce to the extra working required to thoroughly blend quantities of butter of varying shades in color.

In carrying out test 2 all conditions in the manufacture of the butter were exactly the same, the only difference being in the working, as given below.

	Box 7.	Box 8.	Box 9.	Box 10.
First working, in minutes..	2½	2½	Worked once for the same time as the two workings of box 7, and at the same speed of roller	Worked once for the same time as the two workings of box 8, and at the same speed of roller
Second working, in minutes	1½	1½		
Revolutions of roller, in minutes	45	19		
Hours between working....	17	17		

Percentages of Water.

No. 7, 12·0; No. 8, 11·5; No. 9, 13·5; No. 10, 11·3.

The above percentages of water go to show that the decreased speed of roller favored a freer escape of moisture. Sample 7, with a roller speed of forty-five revolutions per minute, and two workings of two and a half and one half minutes respectively, gives 12 per cent. water; and sample 9, with one working of the same time (four minutes), and of the same speed, leaves 13·5 per cent. of water in the butter; while the slow working of boxes 8 and 10 for an equal number of minutes to 7 and 9 produce a much drier article. All along I have been opposed to fast working, and I would suggest to factory managers and their assistants the necessity for closer attention to this important factor in butter-making. No. 9 illustrates in a striking manner that water becomes locked up in the body of butter when it is exposed too long to the influence of a quick moving roller, and I am perhaps safe in predicting that a second working would not expel the excess of moisture without inflicting serious damage to the texture and quality of the butter; and further, I have reason to believe that overworking freshly-churned butter distributes the moisture so finely among the butter fats that a dry appearance is given to the finished article, while at the same time the butter may yield on analysis a high percentage of water. A comparison of results obtained by the steel trier and chemical analysis seem to throw some light in favor of the opinion expressed.

Test 3. Butter Grains and Drainage in Churn.

Test 3 was undertaken to ascertain what effect the sizes of butter grains in the churn would have on the dryness of the butter, and the influence of draining in the churn, and also salting.

Altogether, eight lots of butter were made. The first four were treated as follows:—

	Box 11.	Box 12.	Box 13.	Box 14.
Size of Grains.....	rice	peas	rice	peas

Boxes 11 and 12—Brine in churn, 1½lbs. salt to 5galls. water; dry salt, 3½ per cent.

Boxes 13 and 14—No brine; washed twice; dry salt, 3½ per cent.

Equal quantities of water were used for washing the butter; preservatives at the rate of 12ozs. to 100lbs. butter was added to each lot. The butter was given thirteen minutes to drain in the four lots, and the time of working was two minutes for the first and two minutes for the second, while the speed of the roller was kept at the same throughout. Fourteen hours between working was allowed.

The temperature of the cream was 50° F.; acidity, 5·8. Temperature of washing water was similar, and the time of churning varied very little. The same percentage of fat (0·1) was found in the buttermilk from each churning; 30lbs. of cream were required to make the 20lbs. of butter.

Percentage of Water.

Box 11, 12.2; box 12, 12.2; box 13, 12.5; box 14, 12.3.

According to the above analyses there is practically no difference obtained by churning into grains of small and large size, and the slight difference in salting has been insufficient to cause a rise or fall in moisture.

Drainage in Churn.

In the second four boxes the chief features in manufacture were as follows:—

	Box 15.	Box 16.	Box 17.	Box 18.
Size of grains.....	pin heads	pin heads	peas	peas
Time of draining, in minutes ..	20	20	4	4

All other conditions were exactly the same.

Percentages of Water.

No. 15, 11.8; No. 16, 11.4; No. 17, 14.5; No. 18, 15.4.

Nos. 15 and 16 favor a distinctly drier butter than 17 and 18, and this undoubtedly arises from the longer period given to the drainage of the water from the butter grains. Where four minutes has been allowed the percentages of water have risen much above the average.

Boracic Acid in Butter.

In the experiments just concluded there is something to say on the use of boracic acid. In tests 1 and 2 10ozs. of preservitas was added to the 100lbs. of butter, and in test 3 12ozs. was the quantity given. The analyses of the four boxes in test 3 showed that the butter contained on an average 0.47 per cent. of boracic acid or 32.9 grains to the pound. Where 10ozs. of preservitas was mixed with the butter in tests 1 and 2 the variations in the draining, salting, and working caused considerable difference in the percentages of acid left in the finished article. By carefully handling butter in the churn and worker, however, and by thoroughly mixing the preservative with the salt, little difference in the percentage of the boracic acid will be found in quantities of butter similarly treated. This was proved in the analyses of four separate lots of butter which gave the following percentages:—0.48, 0.48, 0.47, and 0.46. The proportion of preservitas was 12ozs. to the 100lbs. of butter.

Now that we are to have a fixed standard in the use of boracic acid—0.5 per cent. or 35 grains to the pound of butter—I would recommend to all butter-makers not to exceed 10ozs. of preservitas to the 100lbs. of butter. It has been proved in experiments conducted by me that 8ozs. is sufficient to preserve sound export butter, and the use of strong boracic acid compounds added in excess of that quantity will act injuriously to the dietetic value of the product. In my experiments which were made over two years ago, 8ozs. was then recommended, and buttermakers in South Australia have been very careful not to exceed that amount. I might point out to factory managers and others that the finding of the Royal Commission in England only favors the addition of a boracic acid preservative, so that formalin and other of the more dangerous chemical substances will be prohibited from further use in butter.

SUMMARY OF EXPERIMENTS.

What Influences the Water Percentages in Butter.

- | | |
|--|--|
| 1. Feed and season of year. | 7. Strength of brine used. |
| 2. Temperature of cream. | 8. Quantity of dry salt added to butter. |
| 3. Drainage of butter grains in churn. | 9. Speed of roller and time in working. |
| 4. Ripeness and age of cream. | 10. Kind of roller used and worker. |
| 5. Temperature of washing water. | 11. Quality of salt. |
| 6. Temperature of churning-room. | |

[This article will be continued in next number of the *Journal*, when the final tests will be concluded of the refrigerated butter.]

TAINTS AND FLAVORS IN DAIRY PRODUCE.

By G. S. THOMSON, N.D.D., GOVERNMENT DAIRY INSTRUCTOR.

In our previous issue we discussed the essential points to be practised in the milking of cows, and it is to be hoped that farmers have put into effect the suggestions given. Let the young people on the farm be taught the value of care and cleanliness in milking, and as they become older the knowledge gained will enable them to appreciate and understand the true value of dairying education. It will be by this means that the foundation of the industry will be greatly strengthened.

Rule 2. Perfect Cleanliness of Milking Yards.—Some farmers will wonder why so much has been said about this part of dairy instruction. It is because we have already traced taints in produce to the insanitary condition of milking yards. Some months ago my attention was drawn to a very peculiar flavor in cream and butter. Scientific examinations were made of the affected samples, and before long I succeeded in finding that the injury to the cream was the work of a particular germ, and was not caused by the illhealth of the cows or by taint-producing weeds in the food. As the bacteriological investigation was being pursued the factory manager was making inquiries at the farm from whence the milk was supplied. There he was successful in arriving at the source of the trouble, which had its origin in the uncleanly condition of the ground where the milk was kept during the night. As soon as this was explained to the farmer, he recognised the error of having his milk cans in such a dangerous place, and at once set to put everything in a satisfactory state. Since this has been done no further trouble has been experienced. Other illustrations of the same kind could be given, but I think the above is sufficient to fully convince readers of the dangers that result from a want of simple precautionary measures on the farm. To reduce the risks and make the milking yard pleasing to the eye, have the milking bails kept white with lime wash and twice daily have the droppings from the cows removed to the manure and refuse heap.

Rule 3. Perfect Cleanliness of the Utensils Used for Keeping the Milk and Cream in.—The cleanliness of the utensils is another important matter which deserves great care on the part of those who are trusted with the work. When sufficient washing has not been given to cans, fermentation or decay quickly follows in the vessels, and when a supply of fresh milk or cream is added it is at once attacked by hurtful germs and immediately begins to become sour and tainted. You can make this very clear to yourself by a simple experiment. Take two cans of equal size, put a quantity of milk into each, leave the cans in a warm place for twelve hours, after which pour the milk into another vessel. Wash and scald one can thoroughly and dry by exposure to direct sunlight; rinse the other out with cold water and leave standing for eight or ten hours. Add fresh supplies of milk to both cans, and next morning take the milk to the factory and have it tested for its keeping qualities. A more conclusive experiment might be done in this way—Clean and scald two cans, and add equal quantities of milk fresh from the cow; to one vessel add half a tumblerful of acid milk, or whey, and afterwards leave the cans for a period of twelve hours or more, according to the convenience of the supplier. Take to the factory and have both samples examined for extent of sourness. In sterilising dairy appliances you cannot be too particular in the free use of boiling water and soda. And I would point out that extra care is wanted in thoroughly cleaning the seams of milk and cream cans.

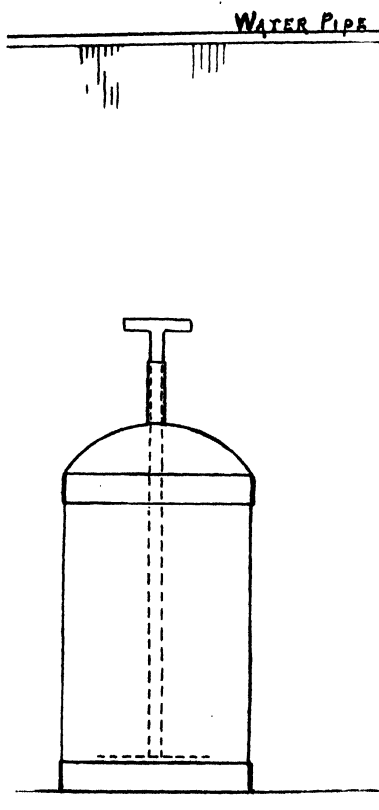
Rule 4. Perfect Cleanliness of the Room or Place where the Milk or Cream is Stored in.—Everyone will agree that it is absolutely necessary to use storage rooms for no other purpose than to keep the milk and cream in. If, on the other hand, it is used for vegetables, meat, and clothing, there is sure to arise injurious odors which will afterwards be found in the stored produce. Have the walls of the room whitewashed with hot lime every three months, and see that sufficient ventilation is provided. Erect wire gauze over the windows, and a gauze inside door will be found very profitable for admitting a free circulation of air and preventing the admittance of flies and other insects.

Rule 5. Perfect Freedom from Objectionable Smells in and Around the Dairy.—The presence of smells in the air surrounding milk or cream is most injurious, owing to the rapid absorbing properties of the raw produce. You can prove this by leaving a small quantity of milk in a room containing the odor of turpentine, kerosene, onions, or any strong-smelling substance, and in the course of a few hours the milk will taste of the impurities in the air. Likewise will milk absorb bad gasses in cow yards, and this will take place in the hot milk as well as when it is cold.

Rule 6. Skilled Treatment of Milk and Cream Before it Reaches the Factory.—

In the milking of cows and in the cleanliness of yards there may in some cases be little fault found, yet the milk and cream may become speedily sour and tainted through being kept in closed cans and shut up in a warm room, or left uncovered in a dusty place outside. It is recommended to place the freshly-drawn milk in the coolest spot in the dairy. Sinking a well for that purpose and stirring the milk and cream at intervals during cooling would repay for the labor incurred. Let the following method of cooling the milk, which has already proved profitable, be tried wherever water is procurable:—

Overhead erect a watertank, attached to which is an iron pipe, preferably gun-metal, pierced with small holes situated at short distances from each other. Underneath is a plain wooden stand, on which the cans are placed; the cans are of the ordinary shape, and have a specially-constructed lid, with a tube on the top 8 in. long, through which passes the handle of the stirrer. On the cans there are stout covers, made so as to be easily removed. From the pipe the drops of water are regulated to keep the covers continually moist. The following diagram illustrates the process of cooling:—



To prove the efficiency of the cooler I had the following test made by Mr Westphalen, of Robertstown, who has been most successful in the application of the system.

Temperatures of Cream and Skim Milk.

	Before Cooling.	After Cooling.			
	11 a.m.	2 p.m.	5 p.m.	8 p.m.	6 a.m. next morning.
Cream—No. 1 can, full	82	74	68	67	61
No. 2 can, full	82	75	66	66	60
No. 3 can, full	80	74	67	66	60
No. 4 can, half full	84	75	68	66	59
Skim milk, full	84	76	70	69	—
Water used	70	72	78	78	68

By the above results it will be found that the average fall in temperature of the five cans during the first three hours was 10°, the second 7°, third 1°, and from 8 p.m. to 6 a.m. 6°, making in all 24°. Mr. Westphalen informs me had the day been hotter than 95° the temperature of the cream would have been lower; but on no occasion has he been compelled to churn the ripened cream at a higher temperature than 58°. Milk and cream suppliers will find the cost of erection of this cooler very little; all that is necessary in the shape of a building being low canvas walls; and a feature of the system is its adaptability to the treatment of small supplies on the farm as well as a large number of cans. Where the above system of cooling cannot be adopted in the preservation of milk, let the aeraters now on sale be put into use, both being efficient appliances for use on the farm.

Rule 7. Conveyance of Milk and Cream to the Factory in a Sweet and Pure Condition.—Having adopted the recommendations in rule 6, it will be an easy matter to provide the factory with sound supplies. With the already covered milk and cream cans well saturated with water, let them be forwarded in that condition, and no matter how warm the weather may be, a quick rise in temperature and degree of acidity will be prevented. If covers have not been employed as suggested in rule 6, have them made purposely for use in the cartage of milk or cream, and by keeping them well drenched with water there will be a gain in the sweetness of the supplies. I would strongly urge suppliers to send the milk and cream to their respective factories in filled cans, which will prevent the evils arising from jolting; but I would point out that this must only be done when the supplies are in a fresh condition. Milk that has become slightly acid should be sent unmixed with fresh sweet milk, and whenever possible keep the morning and afternoon supply in separate vessels. In the case of cream, do not, under any consideration, mix quantities that have become advanced in acidity with a fresh and sweet product. Send your consignments of cream to the factory of your district as frequently as you can.

Rule 8.—Purity of Drinking Water for Cows.—The freedom from impurities in drinking water is favorable to the production of sound-keeping milk; but, on the other hand, when animals receive quantities of tainted water the milk suffers in consequence and does not possess the same good properties. To avoid this danger it is wise to provide a clean and pure supply and to have the drinking troughs situated at a convenient distance to wherever the cows are grazing. If this is not done cows will deny themselves their requirements of water at a time when they are most in need, and this serious want will injure the milking qualities of the cows and encourage the development of disease.

(To be continued.)

POULTRY NOTES.

BY D. F. LAURIE.

NOTE.—Letters of inquiry, &c., should be addressed to me, c/o Engineer-in-Chief's Office, Adelaide, enclosing stamped envelope if reply required.

Poultry Diseases, No. 4.

CONSUMPTION.—This includes scrofula and tuberculosis, and generally is known among poultry breeders as “going light”; a rapid emaciation and wasting away of the tissues. The disease is very common in poultry, and in England *post mortem* examinations prove its prevalence. Without entering into a dissertation as to its nature and history, it may be urged that nothing should be neglected to guard against it and stamp it out. The question as to whether the disease is transmissible from man to animals and *vice versa* has been recently negatived by Dr. Koch, but at the same time it may be remarked many leading scientific lights are not decided, and we can do no better than assume that it is so for safety's sake: therefore, the presence of such birds is a menace. Apart from this nothing but loss and disappointment can result from breeding from such birds, and I for one am strongly against any attempt to treat such cases with a view of alleviation. We know that human beings catch the disease from others, and naturally the same will be found among poultry, especially in the ill-ventilated poultry houses so much in vogue. The causes are many, and as a rule hard to trace; but the treatment is the axe and then the funeral pyre. Liver disease simply denotes scrofulous deposits in the liver, as the weak spot, brought about by improper food. The *symptoms* are such that they are usually only noted by the trained observer during the bird's life; still, as a rule, there is a wasting cough, quick breathing, and expectoration, and when diarrhoea is present in the later stages the case may easily be recognised. In other cases the bowels are attacked, and diarrhoea is continuous and the wasting away rapid. In the majority of cases the lungs are attacked in various ways, and when, as eventually happens, the lung structure breaks down, blood streaks appear in the expectoration.

CRAMP is common among chickens, and is due to damp ground or to running on a boarded floor. Removal to a warm coop, with sandy floor and dry, generally effects a speedy cure. Douglas mixture in the drinking water is a good tonic.

CROP-BOUND (Impaction of Crop).—This is due to improper and irregular feeding and lack of a regular supply of clean drinking water. Starved birds gorge themselves, and the state of the crop is such that there is no action, and the mass swells and hardens, and eventually causes death. Sometimes the distension is so great that it is a wonder the crop does not burst. *Treatment.*—Pouring hot water, oil, or melted lard, and well kneading the crop at the same time, will often be attended with success, especially at an early stage. Occasionally the bird, if held head down after the kneading, will evacuate the contents; but this method seems disastrous to the bird. In case of not yielding readily, an operation should be performed. Pluck a few feathers from upper portion of crop, and make an incision about an inch or an inch and a half long. In all operations the hands should be carefully washed before and after, and the finger nail of forefinger pared smooth so as not to injure the crop during exploration after removing contents. Cases occur where some solid, such as piece of bone or cartilage blocks the outlet of the crop, and so causes impaction; this must of course be removed, and the crop syringed out with warm water which has been boiled. Sew the crop with two or three stitches, tying each separately, then sew the outer skin, taking care not to

include any portion of the crop proper. Feed on soft food such as bread milk, sparingly for a few days, and each day examine the crop, and if the incision is inflamed bathe with carbolic lotion or apply powdered boracic acid.

CROP, INFLAMMATION OF.—This is generally due to the effect of irritant poisons, and according to the poison the remedy must be applied. In all cases the contents of the crop should be evacuated, and then milk, gumwater, etc., should be given freely. If phosphorus has been taken (such as rabbit baits) give magnesia, or turpentine mixed in cream. On no account give oil in a phosphorus case. Lead poisoning is frequent, either near smelters, or from ordinary house painting. Give, after evacuating the crop, half a teaspoonful of sulphate of magnesia, and 5 minims of sulphuric acid in a wineglassful of water—do not delay. In two hours 5 grains of iodide of potassium may be given in a dessertspoonful of water. The practice of spreading quicklime is one I have always protested against. It is an irritant poison to fowls, producing inflammation of the throat, gullet, crop, gizzard, and intestines. Give a full dose of oil, and follow by big doses of milk and barley water, or gum water.

CROP DROPSY.—In young birds generally due to an anæmic condition (deficiency or poverty of blood). It is also in a measure the result of frequent undue extension of the crop through bad attention to food and water. In such cases beat up an egg with a dessertspoonful of milk and give half at night and half next morning before feeding. Feed sparingly on bread and milk, to which add twice a day 10grs. of aromatic chalk. Sourness can be cured by a rhubarb pill every other day, and each day a pill made of powdered charcoal, cod-liver oil, and oatmeal mixed stiff. If distended with wind, acidulate the drinking water with a few drops of nitric acid.

CLOACITIS (vent gleet) is not uncommon, and is generally not understood. I have seen several cases. It is due to inflammation of the mucous lining of the cloaca—the chamber or pouch connected with the rectum—and also into which are received the urinary and genital ducts. If unattended to the disease becomes virulent, and is very contagious. *Symptoms.*—The earliest are heat, &c., round the vent, accompanied by spasmodic contractions of the sphincter at the outlet. Then a milky discharge commences which soon becomes offensive, caking, and obstructing the vent. No delay should take place, or a cure will be difficult. *Treatment.*—Administer a good dose, say half a teaspoonful, of Epsom salts, and bathe the vent with warm water, removing the crust or obstruction, if any. Then, two or three times a day, inject a teaspoonful of carbolic oil—one part carbolic acid, forty parts oil. At the third day give three drops of copaiba in a teaspoonful of linseed oil. Should the discharge not be reduced in quantity or consistency by the tenth day a very weak solution of subacetate of lead may be injected daily, or three grains of tannic acid in an ounce of glycerine, or a plug of cotton or lint moistened with above may be placed frequently in the vent. Give no patent foods or spices.

(To be continued.)

Imported Poultry.

Recently Mr. E. E. Everett, of Renmark, returned from England, bringing with him a Tamlin incubator, a patent poultry house, and a high-class team each of Buff Orpingtons and Campines. The birds are doing well and are laying. Much interest is being evinced in the new breed, so, for information of readers and in view of the fact that the birds will be distributed later on, I will give a short account of

THE CAMPINE FOWL.

The breed takes its name from the Campine district in Belgium, where it is largely bred. The Campine is essentially a layer, and is a medium-sized bird. There is a similar but larger breed called the Braekel, but in England the Campine only is recognised. Although an old breed in Belgium, it is comparatively new in England, and has so far not been bred to great perfection as regards uniformity of type, markings, &c. It is very handsome, and of the Hamburg type, somewhat like the Pencilled Hamburg in marking. It is still the subject of much discussion and correspondence in England as regards standard points, etc., but seems admitted to be of great value. Much has been said about its origin and that of the Hamburg fowl; but that does not matter just at present. The chicks are hardy, quick growers, and feather rapidly and are as plump as partridges at six or seven weeks old, which is a great point with many people. The cocks average 5lbs. to 6lbs., and the hens a pound less. There are three varieties—the gold, silver, and white. So far the silver only is adopted in England. They are non-sitters, and the eggs weigh 2ozs. to 2½ozs. The following is the standard of the Campine Club of England.

General Characteristics.—Beak, short; eyes, bright and prominent; comb, single, medium, with even serrations, coming well back, free from excrescences, upright in cocks, falling over in hens; face, smooth; ear lobes, medium, inclining to almond shape, free from wrinkles; wattles, longish, fine in texture, in proportion to comb; neck, medium length, nicely arched, well furnished with hackle; breast, very full, round, carried well forward; back, rather long; body, broad, tapering to tail, close and compact; wings, large, neatly tucked up; tail, a good length, sickles and secondaries broad and plentiful, carried well out from the body; legs and feet, medium length, toes slender and well spread; size, the larger the better; carriage, very alert and graceful.

Color.—Silver, cock and hen—the novice should clearly understand that there are no specimens in existence conforming to this standard in every respect, but that the following particulars represent an “ideal” bird for breeders to strive to produce:—Beak, horn; eye, iris dark-brown, pupil black; comb, face, and wattles bright-red; ear lobes, white; legs and feet, leaden blue; toenails, horn; neck hackle, pure white; body, wings, and tail, rich beetle-green, mackerel markings or pencillings evenly distributed on a white ground, forming as near as possible rings round the body.

Scale of Points.—Comb, 5; eye, 5; ear lobes, 5; leg, 5; hackle, 10; condition, 10; beetle-green sheen, 15; tail, 15; distinctness and evenness of markings, 30. Total, 100.

Disqualifications.—Legs other than leaden blue, white in face, red eyes.

Poultry Tick in Victoria.

The dreaded tick (*Argas reflexus*) has made its appearance in Melbourne. It was found by the Government expert, Mr. A. Hart, on some birds which had been some time in the freezing chamber. The tick came to life again. This is unusual, as the tick family and the acaridæ generally leave the body of a bird soon after death. It must be remembered, however, that in the works a bird is killed, plucked, dressed, &c., in a few minutes. It is quite probable that the tick has been resident in Victoria for some time, although only now discovered. It will, unless checked, cause a great deal of loss. Special instructions have been issued *re* poultry crossing the border from South Australia, which looks like locking the stable after the steed has departed.

MILK FEVER.—This is curable by the administration of half a bottle of whisky filled up with water, and followed with a dose of Epsom salts.

THE PHYLLOXERA BOARD.

At a meeting of the Phylloxera Board, held on the 18th instant, the secretary laid on the table the reports from the inspector, showing that since the 1st October (that being the earliest date the examination could commence) he had examined, principally in the neighborhood of Tanunda, Greenock, and Lyndoch, 2,150 acres of vines, out of which 650 acres had escaped taxation.

Apart from small patches of vines slightly affected by oidium, the vineyards are looking particularly healthy and vigorous, and a first-class crop is predicted. No signs whatever of the phylloxera have appeared, and vignerons are to be congratulated upon their good fortune in this respect.

The inspector is now at Auburn, completing the district partially examined at the close of the season, after which he will at once proceed to the South-East and make a careful examination of the vines there. His movements will be watched with interest, as this district is, of course, very close to Victoria.

Clause 18 of the Act reads, "All persons planting vines exceeding one acre in extent shall in like manner furnish returns from time to time, and the vignerons' roll shall be amended from year to year." The inspector points out that this is not being done, as he frequently finds vineyards, newly planted, the owners of which have not reported the fact.

Clause 36 of this Act is particularly interesting to vignerons at the present season of the year—"If within any vineyard any sign shall appear, which may reasonably be suspected to be caused by disease, the owner, occupier, or person in charge thereof shall immediately notify the fact in writing to the inspector, or to the Board or Minister; and, in the event of his wilfully neglecting so to do, all claims by such owner, occupier, or person to compensation under this Act shall be forfeited, and such owner, occupier, or person shall on conviction pay a penalty not exceeding fifty pounds."

On January 31, 1902, two members of the Board retire by ballot. This was conducted by the meeting on December 18, and Messrs. Thomas Hardy, chairman district No. 4, and Mr. John Christison, Clare, district No. 6, will accordingly retire on January 31; both are eligible for re-election, and further proceedings will be held forthwith.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Company report :—

January 1, 1902.

For December the weather has been cool and dry, a couple only of intensely hot but short spells reminding us that we are in midsummer. The rust in the wheat plant, it is feared, will be found to have done a good deal of damage when the sum of this harvest comes to be totted up; in some districts whole areas have proved worthless. The season's average of grain will be lowered by this and partial failures in several directions owing to the delayed rains. Fair reports are coming in from pastoralists, feed and water generally being good.

Trade in the city is active as usual at this festive season. Country business is fair, but modified by the late heavy fall in value of metals, the copper mining and lead industries having, it is feared, trying times ahead. The effect on our railway traffic is very marked, a falling away of something like £6,000 a week in the revenue connected with the carriage of ore being shown. For want of water and other reasons work on the Tarcoola goldfields is partly hung up at present.

In European markets breadstuffs ruled firm up to 30s. 6d., c.i.f., U.K., for Australian wheat having been paid, but at moment price is about 29s. 9d. per qr., steady. Sydney and Melbourne quote for shipping parcels 2s. 10½d. to 2s. 11d., brisk; but here the season's export trade is hardly yet opened. Farmer's lots for January-February delivery are being booked at 2s. 9d. Port Adelaide, with corresponding reduction at outports. The weather continuing very favorable for reaping, farmers have hardly yet had time, however, to begin deliveries, and much activity cannot be expected till after the holidays. Millers are contracting for delivery of flour during 1902 to bakers on the basis of £8 12s. 6d. city, and £6 5s. for country brands; but business is not brisk, though values are being well maintained. Owing to the

additional crops cut to save them from the ravages of rust, hay is being very freely offered, and the usual yearly contracts entered into for local supplies of chaff at prices considerably lower than rates ruling for several years past. Inter-State inquiries, however, are being made, and good prospects of further orders from South Africa cause the trade to hope that prices may improve later. In feeding grains values are nominal, owing to farmers being too busy with harvesting operations yet to make deliveries.

The market has been kept supplied chiefly with locally-grown potatoes, the quality and size of which this season has proved exceptionally good, although crops have been digging light. A few parcels of Victorians brought along have caused prices to ease down, but the imported sample is not nearly equal to local, mostly green and uneven in size, some at moment being freely offered at 56s., Port Adelaide. In onions, Brown Spanish are plentiful and cheap; the White Silver crop has about finished up.

December is always a busy month in dairy produce lines. Business, therefore, has been active and a heavy turnover made locally; but, the supply of butter falling off rapidly, an abrupt cessation of export occurred, even the Barrier demand having to be supplied by resumption of imports from Melbourne. Values at the bi-weekly sales steadily advanced, so that up to the holidays a rise of about 4d. a pound during the month was secured on local prints, but a reaction has already set in, and we may expect prices to ease back to more nearly Victorian rates. The supply of eggs coming forward this season shows very considerable increase, but free trade with Melbourne and Sydney is keeping this market clear. Values eased down a little, but are again hardening. Good demand exists for cheese, although samples generally are somewhat new. Bacon is selling freely at hardening rates. Hams have experienced seasonable activity. Honey unchanged. Almonds are quiet now that Christmas orders have been supplied.

Splendid demand for all classes of poultry was apparent during the month, a couple of the usual auction sales making records even for Christmas time. Values ruled fairly steady and satisfactory, though extreme rates were not realised.

MARKET QUOTATIONS OF THE DAY.

Wheat.—Port Adelaide—Shipping parcels, f.a.q., nominal, 2s. 10d. to 2s. 10d½., farmers' lots 2s. 9d.; outports—2s. 7d. to 2s. 8½d. per bushel of 60lbs.

Flour.—City brands, £6 10s. to £6 15s.; country, £6 to £6 5s. per ton of 2,000lbs.

Bran.—1½d.; pollard, 1½d. per bushel of 20lbs.

Oats.—Local Algerian and dun, 1s. 9d. to 2s.; prime stout feeding white, 2s. 4d. to 2s. 6d. per bushel of 40lbs.

Barley.—Malting, 3s. to 3s. 6d.; Cape, 2s. to 2s. 2d. per bushel of 50lbs.

Chaff.—£3 to £3 5s. per ton of 2,240lbs., bags in, dumped, f.o.b., Port Adelaide.

Potatoes.—New locals, £4; Victorian, £2 16s. to £3 10s. per 2,240lbs.

Onions.—Local Spanish, £3 per 2,240lbs.

Butter.—Creamery and factory prints, 1½d. to 1s. 2d.; private separator and best dairy, 10d. to 1½d.; good store and collectors', 8d. to 9d.

Cheese.—South Australian factory, 6d. to 7d.; New Zealand, 9½d. per pound.

Bacon.—Factory-cured sides, 7½d. to 8½d.; farm lots, 6½d. to 7½d. per pound.

Hams.—South Australian factory, 8d. to 9d. per pound.

Eggs.—Loose, 6½d.; in casks, f.o.b., 7½d. per dozen.

Lard.—In bladders, 6½d.; tins, 5d. per pound.

Honey.—2½d. for best extracted in 60lb. tins; beeswax, 1s. 1½d. per pound.

Almonds.—Softshells, 6½d.; kernels, 1s. 1d. per lb.

Poultry.—In live poultry, bright table roosters sell from 2s. to 2s. 6d. each; ordinary cockerels and good hens, 1s. 4d. to 1s. 8d.; a few light birds, 1s. 1d. to 1s. 3d.; ducks, from 1s. 7d. to 2s. 2d.; pigeons, 6½d.; Geese, in very brisk demand, 3s. 6d. to 4s. 6d.; turkeys, 7d. to 9d. per lb. live weight for poor to medium; prime table birds worth up to 1½d. per lb. live weight.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, flour, and forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese.

HAMS AND CHAPS.—Hams, shoulders, and jowls or chaps should be laid upon a slate slab or board in a cool room. Prepare a mixture of 4oz. saltpetre and 8oz. brown sugar, and rub some of this thoroughly around the bones; then rub in best salt, and leave for about three weeks; but every third day rub in a little of the saltpetre and sugar, especially about the bones, and rub in a little more salt each time. Then the meat can be smoked and placed in calico bags in a cool place until wanted for use.

CENTRAL AGRICULTURAL BUREAU.

MONDAY, DECEMBER 16.

Present—Mr. F. Krichauff (Chairman), Sir Samuel Davenport, K.C.M.G., Messrs. W. C. Grasby, Thos. Hardy, R. Homburg, M.P., M. Holtze, J. Miller, M.P., T. Price, M.P., H. Kelly, T. B. Robson, R. Marshall, and W. L. Summers (Acting Secretary).

Secretary.

The CHAIRMAN reported that Mr. Molineux had been granted six weeks' leave of absence.

Vine, Fruit, and Vegetable Protection Act.

The CHAIRMAN called attention to Bill to amend the Vine, Fruit, and Vegetable Protection Act now before the House. This was a matter that the Bureau should have been consulted on, and Mr. Quinn should have been present to discuss it with the members.

Mr. GRASBY considered the Bureau had been treated with scant courtesy; the members should have been consulted on this important matter. The Bill as drafted was most drastic. He had never seen any Act which gave inspectors such powers as the Bill proposed to give. It would prove most oppressive to growers, and if carried into effect would break down of its own weight. It was a most impossible Bill, and he could not protest too strongly against it. He could not understand how such an impossible Bill as this had received the support of the Minister.

Mr. HOMBURG and Mr. PRICE supported Mr. Grasby.

Mr. HARDY thought the Bureau should have been afforded an opportunity of considering the Bill; as most of the members had not seen it before it was not right for them to discuss it offhand.

Mr. MILLER said the Bureau should have had copies of the Bill and Mr. Quinn should be present to discuss it with them. He was particularly interested in the portion of Part IV. of the Bill which would enable growers in districts that were free, or nearly free, of the codlin moth to form fruit districts and rate themselves in order to keep out or extirpate the pest. They had the important districts of Clare, Wirrabara, Penola, and parts of Barossa to consider. There was no doubt that in such cases the destruction of the fruit in infested gardens and preventing the introduction of infested fruit from outside would result in the district being freed from the moth. The new Bill in a sense gave the growers power to protect themselves, and he hoped members would assist him in getting this portion at least of the Bill carried. He confessed he had not studied the other parts closely, but doubted that they were so drastic and oppressive as had been stated.

Mr. PRICE moved and Mr. ROBSON seconded—"That, as the members of the Bureau have not been afforded an opportunity of considering the Bill, the Hon. Minister of Agriculture be respectfully requested to submit the Bill to the Bureau for consideration before asking Parliament to legislate on the matter." Mr. MILLER suggested that the following should be added—"and that in the opinion of the members a short amendment of the present Act should be at once introduced to give power to form Fruit Boards, as provided in sections F, G, H, I, J, K in Part IV. of the Bill." This was agreed to, and the motion carried unanimously.

Several members asked as to Mr. Quinn's position.

The ACTING SECRETARY stated Mr. Quinn was neither a member nor an officer of the Central Bureau, and consequently did not attend the meetings.

Green Manuring.

The CHAIRMAN referred to inquiry from Spain *re* growing of green manure crops. Members pointed out that the climatic conditions did not permit of the general adoption of the practice here. The winter was too short and the summer too dry; if green crops were ploughed in they would not decay quickly enough, and the ground would remain too open.

Improvement of Wheats.

Mr. KELLY called attention to article in *Windsor Magazine* on the improvement of wheats. He also referred to some rust-resistant wheats grown by Mr. R. Marshall.

Mr. MARSHALL showed a number of samples of new crossbred wheats raised by himself. He had grown on his sons' farm this year nearly 200 crossbred wheats, some of which were affected by rust, but at least 100 were quite free. He was sure that it only a question of crossing and selecting to secure early rust-resistant wheats of good milling quality. There was no necessity for farmers to grow rust liable or inferior wheats. Mr. Marshall was asked to draw up list of best rust-resistant wheats.

Mr. KRICHAUFF stated that many old farmers used to say that rust could be prevented by keeping the seed two years before sowing. He believed there was something in this, as the red rust spores would die. He would like to hear the opinions of some of their old farmers on the subject.

Mr. MARSHALL said he never heard of this before, and was sure there was nothing in it. Mr. KELLY agreed.

It was decided that members of Branches be asked to report on wheats which have proved most resistant to rust, also those most liable to injury, with dates of sowing and harvesting. [Will members of Branches please discuss this matter and report at early date?—GEN. SEC.]

Extracts and Translations.

The CHAIRMAN tabled the following:—

Fertilising the Blossoms of Fruit Trees—It may be useful to again draw attention to the not unfrequent sterility of the blossoms of fruit trees. Mr. Waite, of the Phytopathological Department at Washington, United States, has the credit of calling first the attention of orchardists to the fact that the blossoms of certain fruit trees, and especially of pear trees, remain sterile—or what he calls self-sterile—if only one variety is cultivated. A large plantation of only Bartlett pear trees bore no fruit until he inoculated the blossoms with the pollen of other varieties—not from other Bartlett pear trees. Other varieties being at once intermixed the yearly profit was thenceforth 10,000 dollars. Other pears requiring pollen from other varieties are Clairgeau, Easter, Howell, Lawrence, Louise Bonne de Jersey, Sheldon, Souvenir du Congrès, and Superfin, or altogether about one-third of the kinds grown in the United States. An exceptional case is that Kieffer and Le Conte bear in the Southern States, but not in the Northern, without strange pollen. To a certain extent sterility occurs also with apple trees; but this is more dependent on the climate, the weather, the cultivation, and the health of the trees. The pollen of most varieties will be sufficient if the tree is healthy but not too luxuriant, and when the weather at the time of blossoming is fine and warm. The pollen from other varieties, however, promotes fructification, but not from another tree of the same variety, which after all can be only considered as a branch from the original tree raised from a pip. And this agrees entirely with the laws which we acknowledge as correct with regard to animals—that the copulation of near relations gives either none or unfavorable results; and the hereafter-mentioned case of "Baldwin apples" showed that this law does appertain also to the vegetable kingdom. The blossoms on some branches of a Baldwin apple tree were impregnated with the pollen from the Baldwin; others on other branches with that of the "Bellflower" apple. Fruits formed from the former had longer stalks, were much smaller, had less color, and not so good a taste as those obtained with the pollen of the Bellflower apple. And since the above experiment the same results have been obtained with pears. Darwin thought that the seeds in the fruit merely could be influenced, but it is now proven that also the flesh of the fruit is either injured or improved. When it is, therefore, of advantage to intermix varieties of the same fruit, it is not advisable to plant plums, cherries, or other trees next to pears or apples respectively. In 1900 experiments were made by Messrs. S. W. Fletcher and F. A. Waugh with plums, peaches, apricots, and cherries. Of plums Wee Golden Drop,

French Prune, Italian Prune, and six others were found to be self-sterile; of apricots White Nicholas, of peaches Susquehanna, of cherries Napoleon, Belle de Choisy, and Reine Hortense required under certain circumstances strange pollen. Mr. S. A. Beach experimented with vines, and found that those varieties which generally set well from their own pollen are far superior to self-sterile varieties for pollenising others that are self-sterile. It is frequently thought that the wind bears the pollen from tree to tree. This is, however, only done to a very unimportant degree; bees and hymenoptera are the most valuable helpmates of the orchardist.

Comparative Value of Goats and Sheep where a few are kept by an agricultural family. Mr. R. Schmoldt, an agricultural teacher, gives the preference to sheep, and those of a large frame like the Hampshire, that frequently give two or three lambs, even occasionally four (I presume he would be in ecstasies about Mr. Lynn's sheep, of Orbost, in Victoria, where one ewe had six, another four, lambs). The milk consists on the average of:—

	Cows.	Sheep.	Goats.
Water	87.5	82.5	87.2
Fat	3.4	5.3	4.5
Casein	3.2	5.0	2.8
Albumen	0.7	1.6	0.5
Milksugar	4.5	4.8	4.2
Ash	0.7	0.8	0.8

While butter from ewes does not keep well, the cheese is most excellent. Sheep can be kept in an orchard, where goats that like leaves, herbs and branchlets best will gnaw the bark. They also require comparatively more food than cows, and refuse food that sheep would thrive upon.

Feeding of Pigs.—Professor Lehmann, of Goettingen, made experiments with coarsely-ground and whole grains. Of the latter he found of 200lbs. not less than 97.2lbs. of oats and rye undigested; of barley, 109.2lbs.; of peas, only 0.8lb.; so that peas alone were well crushed by the teeth. Whether fodder should be boiled or not for fattening pigs seems to have been finally settled by the numerous experiments made by Professor Henry, of Wisconsin, as they all agree that it should not be boiled, except potatoes. The protein in the grain becomes when boiled less nourishing; if heated above 75° Celsius is less digestible. Bad results with suckers from four to six weeks old may be ascribed to feeding on dirty styes. Straw should never be spared. It is good to give them when weaned (only four to six weeks old) for at least a week five times a day, a little but not much milk at a time and a little barley; sour or buttermilk is at that time dangerous. The trough should be at once cleaned after feeding. Sifted coal dust is very good against diarrhoea; in fact, wood coals are very much liked by pigs. Peeled potatoes are very good for young pigs.

Agricultural Congress at Berlin.—Mr. Vibrans recommended at the divisional meeting for manuring—1. Experimental plots. 2. Increased quantity of fertilisers where the soil is physically in a good state, neither too dry nor too wet and free from weeds; (a) wet and heavy soils to keep in pasture on which it is yet advisable to experiment with fertilisers, as the constituents of such soils may not be easily dissolved; (b) dry heavy soil will give the best results after a fallow; (c) dry sandy soil requires much nourishment; green manuring is advised, then to plant potatoes who also require much potash and phosphoric acid; (d) humose sandy soils and better soils will make the best use of fertilisers. 3. Only on the better soils will it pay at present low prices to grow cereals. Mr. Siemssen, the manager for the Agricultural Association, then reported that the following quantities of fertilisers had been ordered by members and delivered during 1899-1900:—

	1899.	1900.
Kainit and sylvanit	3,482,878cwts.	3,741,582cwts.
40 per cent. kainit	358,958cwts.	428,530cwts.
Thomas phosphate	1,165,216cwts.	1,483,028cwts.
Other fertilisers	938,008cwts.	920,728cwts.

2,356 analyses of fertilisers were made, of which 1,665 were found to be correct, while 691 contained less, and damages to the extent of £397 15s. were obtained through the Association.

New Members.

The following gentlemen were approved as members of the undermentioned Branches:—Elbow Hill, Messrs. S. Pike, J. Wake, W. Tynan, W. Beinke, jun.; Dawson, Mr. J. Nottle; Forest Range, Messrs. F. G. Rogers and F. Mason; Mannum, Mr. A. E. Ramm; Crystal Brook, Mr. L. Forester; Eudunda, R. Kluske.

Reports by Branches.

The SECRETARY reported receipt, since previous meeting, of sixty reports of Branch meetings.

REPORTS BY BRANCHES.

Koolunga, November 21.

Present—Messrs. T. B. Butcher (chair), J. Button, E. J. Shipway, J. Sandow, R. Lawry, W. T. Cooper, George Cooper, T. Freeman, J. Pengilly, J. Butterfield, R. Palmer, and J. C. Noack (Hon. Sec.).

GARDENING.—Mr. J. Button said he would not approve of farmwork being neglected in order to do the gardening; but there were few who could not find odd half-hours of leisure to devote to the work. Nothing adds so much to the appearance of a home as a nicely-kept garden. He believed most of the stone fruits could be grown in the district, but doubted if the pip fruits would thrive. He deprecated the planting of trees in holes, but advised subsoil ploughing or trench ploughing. For vegetable-growing he would fallow the land, to store and conserve moisture. He thought seeds should be sown as early as Easter, whether the rains are early or late. Carrots and Swede turnips can be kept fresh for a long time by burying them in dry soil in a cool shady place. Other members agreed that all farmers should grow at least a few vegetables; but some thought that it does not pay to grow fruit trees here, as they require so much attention, and fruit is not very dear in this locality.

Wilson, November 23.

Present—Messrs. W. H. Neal (chair), T. Barnes, J. Nelson, W. H. Neal, jun., T. Matthews, A. Smith (Hon. Sec.), and one visitor.

"ECONOMY AND MANAGEMENT OF FARMS IN THE NORTH."—The Chairman read a paper to the following effect:—

We cannot work on the same lines as farmers do in those parts of the State where they have a good rainfall. We have learnt by experience that we must do more than actual wheat-growing, on account of the rainfall being so uncertain. In the first place, we must practice economy when we have crops by saving as much of chaff and straw as is possible. Where we often make a mistake is in not protecting our feed as we should. Sometimes pigs, poultry, etc., are allowed to trample down and spoil a portion of it. Then, secondly, farmers must, as far as possible, combine dairying and poultry-raising, &c., so that they have some income the year through. The amount of money made from other sources than wheat-growing is surprising if properly worked. To gain success in these ways a man must use his brains, to have methods of working, and exercise due care in all things. With regard to farm implements, &c., carelessness is often shown by the neglect of a missing nut or bolt, consequently at times such implements are allowed to get considerably out of order, and eventually cost a good deal to repair. Then with regard to stock. We often have too many for the feed there is, and consequently we never have anything fit for the market. This is a great mistake. There is always a right time to hit the market. I have seen farmers with a limited supply of feed hold to stock which were fit to sell wanting more than market values, and consequently they lose condition, and very often the holder has thereby sustained a big loss. Management is the secret of success in this respect. In conclusion, I would advise extreme care in making purchases of articles which may be easily done without; such purchases are sometimes made blindfold, to the after regrets of the purchaser.

Bute, November 19.

Present—Messrs. W. A. Hamdorf (chair), A. Schroeter, H. Schroeter, D. McEvoy, M. Hall, R. Commons, J. H. Brideson, S. Trengrove, F. Trengrove, M. Stevens, and A. Sharman (Hon. Sec.).

ABNORMAL WHEAT.—Mr. Brideson tabled some wheat plants which had produced branches from the nodes or knots, each branch being crowned with an ear. The plants were covered with red rust, and considerably distorted.

Members thought the cause was over-stimulation and too rapid growth. [The plants apparently have been grown near to where some straw has been burned, or on very rich light moist alluvium.—GEN. SEC.]

EXHIBITS.—Mr. Schroeter tabled three varieties of wheat plants, viz., Rattling Jack, splendid growth, large heads, completely ruined by red rust; White Tuscan, good growth, not much affected by red rust; Silver King (distributed by Mr. R. Marshall, of Templars, through Central Bureau), splendid clean white straw, with very large well-filled heads; from a small packet received two years ago Mr. Schroeter grew enough seed to sow four acres last season. Members consider Silver King is a good wheat; Rattling Jack is also good, but too much subject to red rust; White Tuscan is very suitable for hay. Mr. Schroeter also tabled a sheaf of Algerian oats, 4ft. 6in. high, from a crop promising 30bush. to 40bush. of good sample per acre.

Dawson, November 23.

Present—Messrs. R. Renton (chair), P. J. Byrnes, C. W. Dowden, O. Muller, J. H. L. Severin, A. H. Warner, C. Myers, W. Kelly, F. Schebilla, A. F. Dempsey, and J. Nottle (Hon. Sec.).

OFFICERS.—Mr. A. F. Dempsey, being about to leave the district, was thanked for his long services as Hon. Secretary, and Mr. J. Nottle was elected in his place.

GLANDERS.—Question was raised as to symptoms of glanders in horses, and the Chairman replied that the disease is not uncommon in Europe. The disease generally affects the mucous membrane of the nostrils and extends to the lungs. [Fortunately glanders has never yet been found in South Australia.—GEN. SEC.]

Elbow Hill, November 5.

Present Messrs. E. S. Ward (chair), W. Ward, H. Dunn, J. Harvey, W. N. Bienke, W. Spence, G. C. Dunn (Hon. Sec.), and four visitors.

BULL.—Members resolved to purchase a Jersey bull if anything of a suitable nature is offered.

POULTRY DISEASE.—Mr. Ward stated that the following treatment, recommended by the General Secretary, had proved completely successful:—One part No. 1 carbolic acid in twenty parts olive oil, applied with a fine brush to lumps on ears and red rings round the eyes, causing blindness. [The treatment was recommended by Mr. D. F. Laurie.—GEN. SEC.]

Dowlingville, November 22.

Present—Messrs. J. Phelps (chair), T. Illman, W. T. Holland, J. Birkin, T. Lombladt, G. Inkster, R. A. Montgomery, and J. L. Broadbent (Hon. Sec.).

INCREASED FEED THROUGH USE OF MANURE.—Mr. Phelps had noted the increase of feed in some places where manure had been applied, but in other places there was not so much. Mr. Illman said in former years the feed was very scarce, and seemed to be disappearing entirely, although the land was not heavily stocked. Since the use of fertilisers the paddocks are now carrying more stock and more feed than he had seen for seven years. Mr. Montgomery said the quantity and quality of feed had increased, and we now get a return of half the value of the super. used on the wheat lands in the extra

quantity and quality of the grass that comes later on. Mr. Crowell had pointed out to him a patch of stubble where the manure had been missed last season, and the grass there was very poor in comparison with the luxuriant feed where the manure had been applied. The Hon. Secretary remarked that feed was good this year in places where manure had never been applied, but there is no doubt that the use of commercial fertilisers amply repays the outlay even in grass production, because the beneficial effect lasts over several years.

Holder, November 23.

Present—Messrs. J. Rowe (chair), J. Green, C. H. Jaeschke, S. Pickering, H. Pickering, H. Tuck, John J. Odgers (Hon. Sec.), and one visitor.

WHEAT.—Mr. Green stated that World's Champion wheat, presented for distribution through Central Bureau by Mr. W. H. Hawke, of Tiparra, was looking well and still green.

Rhine Villa, November 23.

Present—Messrs. A. Lewis (chair), W. Start, F. F. Payne, and J. W. Vigar (Hon. Sec.).

IMPROVEMENT OF SEED WHEAT.—The Hon. Secretary read the following paper:—

I believe our wheat is capable of being greatly improved by a course of careful selection. I have often noticed that a few years after a new variety of wheat has been cultivated for a few years it degenerates. Steinwedel, for instance, although still a fair average wheat, does not give the returns it did ten or twelve years ago. And so with many varieties that we hear the old farmers talk of have deteriorated out of existence. All this could be prevented by carefully selecting the best heads that are true to type, and by the same means we could increase our yield. Some years ago an English farmer started on the following lines:—He selected a good strong stool of wheat, picked the best head, thrashed that out, and sowed it the next year; he again selected the best stool and head, and so on for eight years; at the end of that time he had a wheat that gave four times the quantity that he got from the original stool. In 1838 M. Fabre, of Agde, in the south of France, sowed some grains of a common cereal grass, and by successive sowing produced in 1846 a crop of wheat equal to any in the district. These examples show what can be done by selection on proper lines. The farmers of this State are greatly indebted to Messrs. Steinwedel, Marshall, Robin, and one or two others for improving our wheat; but we should help them to maintain the quality of our wheat by carefully selecting only the very best of our crop for seed.

Forest Range, November 30.

Present—Messrs. J. Rowley (chair), G. Monks, W. McLaren, A. Green, R. E. Townsend, F. Green, A. S. Gunning, R. Green, F. Rowley, J. Green, and H. H. Waters (Hon. Sec.).

PACKING FRUIT FOR EXPORT.—Mr. R. E. Townsend read the following:—

When leaving for England last March I got a letter of introduction from the Minister of Education in Adelaide to Mr. Burney Young, of the Produce Depôt in England. I visited Covent Garden Market on five different occasions, and noted the sales of Australian apples and pears, but more especially the South Australian apples. I found them, on the whole, fairly well packed and graded, but some of them were so badly packed and graded as to be almost useless; in fact, the salesman had to take what he could get for them. The well-packed realised as much as 16s. per case, whereas the badly-packed realised only 3s. per case, and a trouble to get rid of at that price. We have a great future ahead of us in apple export, but we must take care in grading and packing, and only have one size apples in a case. I must specially praise Mr. Stephen Hannaford, of Cudlee Creek, for his apples, as they were packed to perfection; and also Messrs. George Wilcox & Co. for their excellent packing. They both deservedly realised the highest prices. I saw some of their apples a month after their arrival in England without a bruise on them.

Now, as to packing, we must pack them all of one size in a box, whether they are large or small, and they must be free from codlin caterpillar. I heard of codlin moth being taken out of South Australian apples in London. We must not be afraid to put a little extra packing between them, so that they will not rub and bruise. Another little item worth noticing, too, is that we must put "Adelaide" as well as South Australia on our cases. For instance, in South Wales I bought some "Australian apples," as I was told. Thinking they were not up to our standard, I asked to be allowed to inspect the case, when I found they were Tasmanian apples. Now, South Australia, Western Australia, and Australia generally are considered one and the same thing; people have no idea what our State really is, so we do not get fair play, as our apples are decidedly superior to Tasmanian; but if we mark our boxes "Adelaide" it will be better understood. It is a different affair altogether to be in London to what it is to be here, as everything is so up to date there. Fruit must be good to bring a good price. I consider the best way to send fruit is through the Produce Dépôt, for I believe Mr. Burney Young does all in his power to obtain the best results.

Now for an experiment which I tried on my way home to England. I had two small parcels of apples, about 30lbs. each, under my care. One case we opened and used for ourselves; the other case, in which the apples were simply wrapped in paper, we did not open until we reached Italy. They were both simply left in my cabin, not in cool storage. On arrival in Italy, after travelling through the tropics, we agreed to open them, when we found them in excellent condition, so we nailed them down again until we reached Southampton. When opened there for Customs inspection we found them in good condition, so we took them on to London.

I made inquiries *re* codlin moth whilst in England, and found that they only have one brood in the year, and the public do not trouble much about them; they simply cut out the part in which the codlin has been; but of course we must not send them, as the apples would probably decay on the way home. We need not be afraid of English markets, as in my travels (and I was across England from east to west) I noticed the orchards are never cared for, and the trees seem to me to be left to look after themselves.

The following are the prices and kinds of apples I saw sold in Covent Garden Market:—Pomeroi or Cleopatra, 14s. to 16s. per case; Esopus Spitzenberg, 14s. to 16s. do.; Dumelow's Seedling or Five Crown, 15s. and 16s. do.; Rome Beauty, 13s. to 15s. do.; Hoovers, 3s. I consider Hoovers quite unfit for export. I saw a few South Australian pears sold, mostly Vicar of Winkfield, *alias* "Napoleons," and I afterwards saw some of the same pears sold in the retail shops at 4d. each; so we might very well send some pears home with careful packing. I had an introduction to the salesman through Mr. Burney Young, and he considers better packing and grading must be done to insure success.

RAINFALL.—Forest Range: For October, 4·66ins.; for year to date, 35·25ins.

EXHIBIT.—By Mr. J. Green—Splendid sample of Ostrich gooseberries.

Morgan, December 2.

Present—Messrs. R. Windebank (chair), H. Hahn, H. H. Plummer, W. G. F. Plummer, G. Ruediger, A. F. Heinrich, C. F. W. Pfitzner, J. Pope, E. French (Hon. Sec.), and three visitors.

CENTRAL BUREAU.—Mr. Grasby's suggestions for the reconstruction of the Central Bureau were considered at length, and most of them were agreed with. Some of the members, however, were of opinion that if all his suggestions were adopted the influence of the official members would predominate in the working of the Bureau.

Petersburg, November 30.

Present—Messrs. W. Miller (chair), J. M. Cadzow, J. Pilkington, H. Earle, and Jas. Wilson (Hon. Sec.).

WHEAT DISEASE.—The Hon. Secretary reported that Mr. T. McKeough had sent him samples of diseased wheat plants taken from a paddock of about thirty acres. There were patches all through where the wheat was dying off. The plants had been sent on to the General Secretary, who submitted them to Professor McAlpine, of Melbourne, for identification, and he reported that he

found a number of nematodes on the roots. These are also known as "eel-worms," and attack the roots of various plants, causing great loss in places. The General Secretary did not know what could be done to destroy them in the land, though a good heavy dressing of lime might be effective. Members were of opinion that the plants were attacked by "takeall."

STANDARD WEIGHT OF WHEAT.—The crops have not progressed as satisfactorily as could be wished of late, the hot weather having brought the crops, which were backward, along too quickly, and it is feared that the grain will be more or less shrivelled. The yield will also be under expectations; red rust has made its appearance, but it was thought that in this district it would not do much harm. Mr. Cadzow thought there would probably be some trouble this year between the farmers and the wheatbuyers in reference to the weight of wheat. He had not got much confidence in the correctness of the small testing measures and weights used by the buyers, and therefore suggested that the Branch purchase a standard bushel measure, by means of which disputes might be settled. It was decided to do this, Mr. Cadzow offering to supply funnel required for filling the measure properly.

Richman's Creek, November 25.

Present—Messrs. A. Knauerhase (chair), J. M. Kelly, J. H. Lehmann, J. J. Searle, P. J. O'Donohue, J. J. Gebert, and J. McColl (Hon. Sec.).

WHEAT SAMPLES.—Hon. Secretary tabled varieties of wheat, including Clubhead, World's Wonder, Gluyas, and several others. Clubhead and World's Wonder were proving to be rather late, and were likely to suffer from hot weather, and they showed more red rust than the earlier sorts.

BARE PATCHES.—Mr. O'Donohue stated that the patches in wheat crops which had been bare in former seasons, and were supposed to be affected by salt, were this year bearing better crops than were carried on the adjacent soil. Formerly the wheat died off completely on those patches.

PHOSPHORUS AND BISULPHIDE OF CARBON.—The Hon. Secretary directed attention to Mr. Goyder's warning of the danger of grass fires through the mixing of phosphorus with bisulphide of carbon. Mr. Lehmann said he had used four bags of bran and pollard last year with phosphorus mixed with carbon bisulphide, but had no trouble with it, although spread all over his grass land. There must, however, be the greatest care used in mixing to minimise the risk of fire.

STAR THISTLE.—Members reported this weed to be very abundant, and desire that the provisions of the Act shall be stringently enforced.

Mount Gambier, November 23.

Present—Messrs. W. Mitchell (chair), J. Kennedy, J. Dyke, J. Watson, M. C. Wilson, J. C. Ruwoldt, T. L. Browne, T. Edwards, and E. Lewis (Hon. Sec.).

PRIVATE SEPARATORS V. FACTORIES.—In discussing the paper read by Mr. J. Davidson at the recent Bureau Congress in Adelaide upon this subject, Mr. Dyke had taken exception to what he had understood to be Mr. Davidson's intention to interfere with the right of the private dairyman to use his own separator, but he had since learned from the author that he was only opposed to hand separators when they came into competition with the dairy factory in their vicinity. Mr. Davidson's paper was then read, and it showed that the writer urged that it would pay (taking good and bad years together)

for any dairy farmer residing within six miles of a good factory to deliver his milk—[or newly-extracted cream.—GEN. SEC.]—at that factory. Members supported that argument.

ANNUAL TOUR.—On November 27 the following members visited the neighboring farms :—Messrs. W. Mitchell (chair), J. Watson, T. H. Williams, J. Dyke, M. C. Wilson, J. C. Ruwoldt, T. Edwards, D. Norman, jun., D. Norman, sen., W. Barrows, and E. Lewis (Hon. Sec.). Mr. Edwards' farm, at Mount Schanck, nine miles from Mount Gambier was first inspected. On the road many herds of fine cattle were seen fattening on the Moorak Estate. At Mr. Edwards' the first item noticed was a mob of forty splendid fat bullocks. Forty years ago this farm was a dense forest, now it is an open farm with orchard, garden, fields, and pastures supporting forty to fifty head of cattle, 600 sheep, and a large number of horses. Most of the horses are of exceptional merit, some by Pride of Riccaston (now dead), others by Souter Johnny II. A two-year-old draught stallion (King of Quality) was also greatly admired. The stables, outbuildings, sheds, styes, byres, barn, and other erections were substantial and well arranged. Implements of all kinds were to be seen, either in the sheds or out in the fields at work. A nice lot of about twenty Berkshire pigs were in the styes. In the garden were all sorts of vegetables, many varieties of fruit, and several kinds of shrubs and flowers; and Mr. Edwards said that since the trees had grown there had been no frosts, which had been frequent and severe previously. Sparrows had eaten all the cherries. The aged ewes and their lambs are fattened and sold, and the younger and best-class animals are kept on the farm. Feed was abundant on all the paddocks. This farm consists of 250 acres of rich volcanic soil, on which there are 20 acres of oats and 30 acres of grass to cut for hay, 33 acres potatoes, and 15 acres barley. On the farm at O.B. Flat he has 46 acres barley, 35 acres wheat, 35 acres potatoes, and 20 acres rye grass for seed. At Wye he has 2,600 acres, 1,500 acres in Kongorong, and 680 acres near Port MacDonnell, and 8,600 acres at Millicent. From those various places he had the fleeces of about 13,000 sheep. Next place visited was the estate of Mr. W. J. T. Clarke, near Mount Schanck, who first showed 40 acres of Algerian oats, surrounded on west, north, and south with a chain width of potatoes to act as a fire break. Both oats and potatoes were growing splendidly. A flock of stud Lincoln ewes with lambs was observed. Lately Mr. Clarke bought between 200 and 300 Merino rams for use with the Lincoln ewes to produce a comeback which he hopes will give a paying fleece. Pure Merinos will not thrive on the Schanck, and to guard against the flock approaching too near that type Mr. Clarke now breeds Lincolns. Water is raised by windmills to elevated tanks, and thence is distributed to house, outhouses, &c., and gardens, where flowers, vegetables, fruit trees, &c., are doing exceedingly well. An incubator raises a lot of ducks and chickens. The small well-designed slaughter-house was greatly admired, and butchers could take valuable hints from its arrangement. Sheds, cart-houses, and many other outbuildings were found to be substantial and well arranged. About 70,000 sheep were shorn here this season by forty shearers and the usual army of attendants—totalling about seventy. On the return journey, at O.B. Flat Mr. Clarke showed how he was fighting sand drifts, in some cases by sowing rye grass, and where the drift is too great for that he has planted marram with satisfactory results. Mr. A. C. Spehrs was next visited, and then Messrs. Davis Brothers' farm. Both places have been described several times previously, and on this occasion there was no falling off in the splendid perfection of every department. At each of the places visited the members experienced the profuse hospitality characteristic of farmers in the district—and everywhere else—and the party returned to Mount Gambier highly pleased with their annual outing.

Amyton, November 11.

Present—Messrs. John Kelly (chair), W. Hawke, W. Hughes, H. Gray, R. Brown, W. Mills, T. Gum, W. Gum, H. Turner (Hon. Sec.), and three visitors.

BUTTER FACTORIES AND PRIVATE SEPARATORS.—Mr. J. Davidson's Congress paper on this subject was read and discussed, the delegates to Congress giving their impressions of the paper and the discussion. Mr. W. Gum disagreed with a good deal of the paper. He contended that the introduction of the private separator had more to do with the improvement of the quality of our butter than the co-operative factories. He thought Mr. Sandford's statement that "of 32 tons of butter manufactured at an Adelaide factory from separated cream 60 per cent. was made into the best butter, and the lowest grade butter fetched 11d. per lb. during the hottest month of the year" spoke volumes for the private separator, yet Mr. Davidson condemns it generally. [Two points here require attention. Mr. Davidson, in his paper, condemned the use of the private separator within six miles of an established factory—a very different thing to condemning it generally. No one in his senses denies the value of the separator; the question is one beyond discussion. Then it is not of much use quoting the figures given by Mr. Sandford unless we know—first, how much of this cream was less than thirty-six hours old, how much of it came from Victorian and South Australian factories, and how much of it consisted of farm-separated cream in small lots seventy-two hours old or more? The fact that the poorest butter fetched 11d. per lb. is in itself proof that there were some abnormal conditions. Much cream arrives in Adelaide which it would be simply impossible to make into butter that would realise this amount under average conditions.—GEN. SEC.] Mr. Gum admitted that the two systems should not compete, but work side by side. The separator was required for milk that could not be taken to a factory, but take away the private separator, and he did not know what the farmers in the dry districts would do. [Mr. Gum admits here all Mr. Davidson contends for.—GEN. SEC.] After considerable discussion, a vote was taken, and, with one exception, members agreed with the main points of Mr. Davidson's paper. They admitted that if cream from the private separators was treated in the way it should be by the farmers, they would not support Mr. Davidson, but so long as the practice of keeping cream for a week, or until the can is filled, or of filling the can with cream of varying ages until it may be decomposing at the bottom though fresh at the top, just as suits the farmer's convenience, they could not but side with him.

Craddock, November 23.

Present—Messrs. R. Ruddock (chair), W. Symons, A. E. Clarke, B. Garnet, J. H. Lindo (Hon. Sec.), and one visitor.

WILL GRAZING PAY AT PRESENT RENTALS?—Mr. Clarke initiated a discussion on this subject. He did not think it would pay; the land would only keep sheep, and it would take 10,000 acres to keep 1,000 sheep, and the land would require to be dog-proof fenced; so that with rent at 1d. per acre, interest on fence $\frac{1}{2}$ d. per acre, rates, taxes, and other expenses, it would cost 1s. 6d. per head of sheep per annum; while the return could not average more than 2s. per head, leaving only £50 to maintain a family for a year. Mr. Garnet thought that 1,000 sheep could not be kept on 10,000 acres in this district during a season of drought. The Chairman was of opinion that with a rent of 1d. per acre grazing would pay here. Taking the past twenty years as a guide, 10,000 acres would keep 1,000 sheep.

BUNT.—Members reported that bunt was very prevalent this season, especially in unpickled crops.

Kanmantoo, November 21.

Present—Messrs. Thomas Hair (chair), W. G. Mills, J. Mullins, F. Hair, Thos. Hawthorne, F. Lehmann (Hon. Sec.), and one visitor.

WHEAT EXPERIMENTS.—The Chairman tabled sample of Ranjit wheat; it was as early as Early Para, more rust-resistant than Purple Straw, a tall variety, but liable to go down. Majestic seems a very prolific wheat, is later than Ranjit, and does not seem so suitable for the district. The Hon. Secretary showed King's Early wheat, very rusty; World's Champion, not so rusty, and very good head; Purple Straw, Dart's Imperial, and Ranjit did not show much rust; Silver King had very little rust. All varieties were sown about middle of July, and manured with mineral super. It was decided that members bring in ripe samples of different wheats in order to judge the effect of the rust on the grain.

HAYSHEDS.—The Hon. Secretary read a paper on this subject to the following effect:—

As the binder is now generally used for cutting hay it can be packed into a lesser space than when loose hay is stacked, and it is cheaper to cover with iron. When a shed is built with a permanent roof for covering the haystack the rain beats in on top of the hay when half the stack is gone. To avoid this he proposed to have the roof to shift downwards as the hay is removed, being retained where desired by means of pins at the four corners. For a stack of 12 to 16 tons the roof would require two 14ft. pieces V.D. hardwood, 4in. x 3in.; two 14ft. pieces Oregon, 3in. x 3in.; three 13ft. pieces Oregon, 3in. x 3in.; and fourteen sheets 7ft. galvanized iron. The roof when put together should be laid on the ground; raise one end 18in.; put a 23ft. to 25ft. pine pole at each corner, 3ft. in the ground, bedded in concrete, and quite upright. Then bore 4in. holes at regular intervals in the four poles, so that iron pins can be put through to support the roof at any elevation required, but giving it a slope of 18in. to throw off the rain. Four men could lift the roof up between the poles, and when the stack is finished it should rest on top. The cost of timber and iron for a roof of this size would be about 46s. in Adelaide.

Mannum, November 22.

Present—Messrs. J. G. Preiss (chair), R. P. Scott, J. Nicholls, R. Heidrick, B. Baseby, J. L. Scott, J. A. Schutze, J. E. Schuetze, and W. H. Quartly (Hon. Sec.).

EXHIBITS.—The Chairman tabled plants of Theiss and King's Early bearded wheat; both sown on same date and with phosphate. King's Early was fit for harvesting, but Theiss was quite green and late, quite hardy, and showing no ill effect from the continuous dry weather. Other members showed samples of Y.P. Clubhead wheat, which were much admired and considered to be well worth attention. Samples of Hanna barley were very strong and hardy. This is recommended strongly for malting.

CONFERENCE.—Resolved to hold a conference of River Branches on the last Tuesday and Wednesday in February, 1902.

Lipson, November 24.

Present—Messrs. Geo. Provis (chair), E. Thorpe, W. F. Darling, Chris. Provis, Caleb Provis, Jas. McCullum, James Brown, G. Carr, A. B. Wishart, H. Brougham (Hon. Sec.), and two visitors.

GUANO.—Hon. Secretary tabled analysis of a local guano showing 22.48 of tricalcic phosphate.

RED RUST.—Mr. C. Provis tabled a nice sample of Steinwedel wheat from d. a crop just reaped. The field was attacked by red rust, but no injury re-highted; owing, probably to its earliness. Resolved to try and secure some

seed of Ward's Prolific wheat, which members consider to be most resistant of rust. It is generally admitted that the early maturing varieties suffer least from rust—especially those with fine straw.

EXHIBIT.—Mr. A. B. Wishart tabled a nice clean sample of Algerian oats.

DISTEMPER IN DOGS.—Mr. E. Thorpe wished to know what treatment should be given to dogs suffering from distemper, and was recommended by one member to give the dog a copper rivet. Another member had adopted the rivet idea, but it killed the dog. Mr. C. J. Valentine, Chief Inspector of Stock, advises:—"If bowels irregular, give small doses of castor oil, from a teaspoonful to an ounce; if this acts, follow with doses of hyposulphite of soda, in 2grs. to 6grs. doses. Do not administer a lot of medicine to cause too much disorder in the stomach. If much prostration, give a dessertspoonful of sherry or one dram of nitrous ether three or four times a day, in addition to the hyposulphite. Feed moderately—milk and water, porridge and milk. Five-drop doses of nux vomica three or four times a day, or less, is sometimes good. Keep warm and clean. A veterinary is the proper man to look after it."

Hahndorf, November 30.

Present—Hon. A. von Doussa, M.L.C. (chair), Messrs. C. Bom, H. Spoehr, F. H. Sonnemann, T. Grivell, P. Schubert, C. Jaensch, A. L. Pacch, J. G. Gallasch, D. J. Byard (Hon. Sec.), and visitors.

BOT FLY.—Mr. Spoehr, of Balhannah, exhibited a fly which he had found troubling his horses. It laid its eggs under the jaw of the horse, after the manner of the bot fly. Whilst hovering about the horses they became quite unmanageable. [A strong decoction of tansy (*Tanacetum vulgare*) is said to be the only cure for bots in the stomach of a horse.—GEN. SEC.]

"**THE PIG INDUSTRY OF SOUTH AUSTRALIA.**"—Mr. H. A. Monks, of Littlehampton, read a paper on this subject.

Forster, November 28.

Present—Messrs. J. Retallack (chair) John Johns, W. Johns, A. Johns, J. Sears, F. Towill, J. Childs, J. D. Prosser, E. Schenschel (Hon. Sec.), and five visitors.

HORSE DISEASE.—A member wished to learn if there is any remedy for a mare which is troubled every spring with a swelling commencing at the udder and extending to the root of the tail.

EXHIBITS.—Mr. J. Retallack tabled five varieties of wheat raised from seed sent out by Central Bureau, including Majestic, Silver King, Marshall's Hybrid, Ranjit, and Bartlett's Crossbred. The grain of each variety was slightly shrivelled. The Hon. Secretary said the wheat sent out by the Central Bureau as "World's Champion" is known in this district as Dart's Imperial. [Are you quite sure no mistake has occurred.—GEN. SEC.]

Appila-Yarrowie, November 22.

Present—Messrs. P. Lawson (chair), J. C. W. Keller, C. W. H. Hirsch, N. Hannagan, J. Daley, J. H. Klemm, W. C. Francis, R. H. Grant, G. A. A. Becker, G. G. F. Bauer (Hon. Sec.), and one visitor.

SUGGESTION FOR IMPROVING THE BUREAU.—Congress paper by Mr. Grasby on this subject was discussed. Mr. Hannagan objected to the proposal that the election or nomination of members of the Central Bureau should

be left to the few official members. He thought that while a few of the present members could not claim to know much about agricultural matters, most of them were very good men for the position. A motion favoring Mr. Grasby's suggestions was defeated, an amendment that the constitution of the Central Bureau remain as it is being carried. It was also decided that this Branch suggests that the maximum membership of the Branches be increased to twenty-four.

BRANCH SHOW.—It was decided that a show of products be held at Appila about March next.

Murray Bridge, November 23.

Present—Messrs. R. Edwards (chair), W. G. Hannaford, A. Kutzer, J. G. Neumann, H. Schubert, W. Wundersitz, and W. Lehmann (Hon. Sec.).

FARM BUILDINGS.—Discussion on paper by Hon. Secretary on general farm buildings was resumed, but no information was elicited.

MIXED CHAFF.—The Hon. Secretary referred to the question of checking the sale of adulterated chaff. There were some chaff dealers who make it a practice to add a quantity of headed straw with hay chaff and sell it as hay chaff. It was unfair to the honest dealer to allow this, as he was compelled to accept a lower price in order to compete with the mixed chaff. It was also unfair to the buyer who pays for and expects chaffed hay, but gets instead a considerable quantity of straw. He thought there should be legislation to prevent the adulteration of chaff. One member pointed out the difficulty in ascertaining whether the chaff was "mixed," which would render legislation useless. Another member expressed the opinion that some chaffed hay was not so good as clean wheaten hay mixed with a small quantity of chaffed header straw; wild oats allowed to go too ripe would make worse chaff than the so-called mixed chaff. This was another difficulty in the way of legislation.

Tatiara, November 3.

Present—Messrs. W. E. Fisher (chair), A. D. Handyside, M.P., F. Smith, D. Makin, P. Low, H. Killmier, H. W. L. Killmier, T. Moten, and T. Stanton (Hon. Sec.).

WATTLE CULTIVATION.—A paper by Mr. T. Hall was read, as follows:—

This is a comparatively new industry in the Tatiara District, but it will be a very important one when it is fairly developed. We cannot carry all our eggs to market in the same basket, but must try a little of everything that we can grow or produce, and if we only get small profits and quick returns we may be able to keep things going. Wattlebark is a profitable article. In wattle-growing districts years ago we stripped about 80 tons of bark off about the same number of acres, and at even \$4 per ton that would mean £120. To start a plantation would mean a good lot of labor and time, as wattles take six to eight years to mature, but when once planted, the land, with care, will need no second sowing. If a fire is run through where the old trees were barked on the previous spring there will be any amount of young trees come up, in fact it will be necessary to thin them out. The most suitable ground for wattle cultivation is the light sandy loam. We have thousands of acres suitable for this cultivation in the Ninety-mile Desert that would bring in very good returns for the outlay. The best means of starting the wattles is to take a single-furrow plough, start on one side of the land it is intended to plant, throw a furrow both ways as you would finish a land, then turn them back and form a crown, and sow the seed on the top of the crown from 1½ in. to 2 in. deep and 6 ft. apart. Then you would be able to bark every other one in about four or five years, and leave the others for one or two years longer. Throw the limbs and boughs of the first barked around the trees barked, and set fire to them. There will be plenty of young ones come up to take the place of those destroyed by barking. Form the crown 12 ft. all through the block to be sown. Another way to sow is broadcast, with a

crop of wheat or oats that is intended for hay. To prepare the seed for sowing cover them with boiling water, and let them soak for twelve or fourteen hours. The best kind to sow is the broad-leaved or golden wattle, as it produces the thickest and heaviest bark.

TAKEALL.—Mr. Low wished to know if commercial fertilisers will prevent takeall in wheat crops. Members thought that the manures would have no effect in that direction. [It all depends upon which of the fifty different "takealls" is meant.—GEN. SEC.]

Mount Bryan East, November 23.

Present—Messrs. A. Pohlner (chair), J. Wilks, B. H. K. Dunstan, G. Taylor, J. Thomas, W. Bryce, T. Wilks, J. Honan (Hon. Sec.), and one visitor.

CONDUCT OF BUSINESS.—Resolved—"That each member, when speaking, shall rise, and confine himself to the subject in hand. When he has resumed his seat any member may question him on the matter, but not before." The reason for this being that some members have been in the habit of interrupting others who may be speaking and thus causing a waste of time.

SEED DRILLS.—Some members hold the opinion that the seed-drill and manures have not had a sufficient trial. It is admitted that the climate is chiefly hot and dry, but one or two years' experience is not sufficient to decide so important a question as this, and Mr. Pohlner has decided to secure a drill to sow seed and manure together.

CATTLE DISEASE.—A resident having lost seven cows during the past twelve months, it was decided to endeavor to have an investigation by a competent person when the next cow is attacked. The symptoms were stiffness and loss of power in the hind quarters.

Kapunda, December 7.

Present—Messrs. W. M. Shannon (chair), W. Flavel, H. T. Morris, G. Teagle, Pat. Kerin, R. B. Banyer, J. H. Pascoe, J. J. O'Dea, C. E. Weckert, Peter Kerin, and G. Harris (Hon. Sec.).

WHEAT EXPERIMENTS.—Mr. O'Dea showed sample Gamma wheat, from Bureau seed. The heads were well filled, free from rust, and the grain well protected and not easily shed. Mr. Peter Kerin stated that he received sample of Club Head from the Branch, but he omitted to pickle it, with the result that the crop was affected by bunt. The Chairman suggested that at the next meeting members should give their experiences with wheat this season. He had tried five different varieties, and there was a wonderful difference. He had found in wheat sown side by side that some was badly affected by red rust and other kinds were not. Mr. Banyer tabled sample of Early White Flat onion, grown by Mr. H. Woodlands, at Taylor's Gap. The onions were of large size and good appearance, but members did not think they would keep well.

SPARROWS, TREES, AND HEDGES.—Discussion took place on paper on this subject read at previous meeting by Mr. Teagle, who stated he had never found sparrows' nests in his hedges, but in old houses, hollow posts, &c. Mr. Morris said he had seldom seen the nests in the hedges. Mr. O'Dea thought the acacia hedge a valuable shelter for stock, but it was objectionable, as the shelter it afforded to sparrows made it more harmful than beneficial, and it should be destroyed. This hedge was also a harbor for rabbits. Thatched roofs were splendid harbors for sparrows, but unfortunately they could not all afford iron roofs to their sheds, &c. He thought the district councils should pay for sparrows' heads and eggs, and that during May, June, and July poisoned wheat

should be used freely. Mr. Teagle had read in an American paper that some time ago a number of farmers agreed to make simultaneous raids on the sparrows every week. This was kept up for over twelve months, by which time there was scarcely a sparrow to be found in the district. The Government buildings in South Australia were great harbors for sparrows. There were thousands of the birds about the Light Bridge, at McCarthy's Crossing. Mr. Flavel gave some of his experiences a few years ago with the sparrows on his farm at St. Kitt's Creek. His method had been that as soon as a sparrow showed itself he shot at it, keeping a gun loaded for the purpose. In a very short time they did not wait to be shot at. He found it better to wound than to kill them. If they were not allowed to remain quietly about a place they shifted elsewhere. They only accumulated about the homestead and would not stay long on a deserted place. He had any quantity of old peppermint trees in the grass paddocks, but if they were not allowed to remain about the house they did not build in the trees on the farm, and as long as he remained on that farm he did not think he saw there on an average one sparrow in a month, but some of his neighbors, not more than a mile away, had hundreds. When he came to live in Kapunda there were hundreds of sparrows on the place. They were very tame, and would settle on the wire fences quite close together. He had killed nearly twenty at a shot. They would not wait for that now. He thought the best trap on the place to catch sparrows was a low, well-trimmed, boxthorn hedge. They go there to roost and the cats were there waiting for them. The hedge being low the sparrows are easily caught; but if the hedges are not kept trimmed it is a good shelter for them, even more so than the acacia; but he had not yet seen a sparrow's nest in a low boxthorn hedge. Mr. Banyer had a boxthorn hedge and had never seen a sparrow nest in it yet, but they nested in the trees on adjoining properties. Mr. Morris said they would have to do something themselves, and not look so much to the Government. If the district council assisted in the destruction by payment for heads and eggs, everybody had to assist. It was something like the battle they had with rabbits some years ago.

Reeve's Plains, November 22.

Present—Messrs. W. H. George (chair), J. G. Folland, H. Day, W. Day, R. B. Jenkins, W. S. Cosden, J. G. Dawkins, A. Arnold, and J. McCord (Hon. Sec.).

GENERAL FARMING.—Mr. H. Day read a paper on this subject:—

To work a farm profitably requires a lot of skill and experience. From his experience on a farm of 400 acres he would have 200 acres in crop, 130 fallow and the rest for grazing. He would fallow early, commencing as soon as possible after seeding, as the early fallow always gave the best crop. Where the soil will allow, plough not less than 5in. deep. Commence seeding about the end of April, and finish as early as possible. Much, of course, will depend upon the weather; last season was exceptionally favorable, and it took less time and trouble to do good work. Every farmer should see that his fences are good, having them sheep-proof with six wires. He believed in small paddocks, having four or five of twenty to thirty acres each, for sheep, and moving the stock from one to the other. Keeping a few sheep was profitable; they keep the farmer in mutton and give a good return for the feed consumed, besides keeping down weeds. All machinery should be cleaned and put under cover when done with, so as to be ready for work when required. All implements, such as ploughs and scarifiers, should have the nuts well greased at least once a year, a plan he had adopted for several years, and which he found made a great saving in the blacksmith's bills, besides saving the farmer's temper. Every farmer should breed his own horse stock, and keep only sufficient to make up his teams, excepting two extra light horses for knockabout work. He found it paid to breed draught stock; light horses were a nuisance on the farm and robbers. His experience was that it did not pay to keep cows except for the use of the family. Pigs pay where there is a dairy, but it did not pay to feed them on wheat only. He found it paid to feed wheat even at 4s. 6d. per bushel to poultry.

Mr. Folland did not believe in early sowing or sowing in dry weather. Mr. W. Day believed in summer fallowing, and considered depth of ploughing in scrub land of little importance, the after-working of the fallow being, in his opinion, of more consequence. Mr. Jenkins advocated early fallow, but did not agree with the paper as to light horses. It was equally as profitable to breed good light horses as draughts. He grew barley for his pigs and fed it to them boiled, with very satisfactory results. Every farmer should have a forge; it would soon pay for itself in saving of time and money for repairs. Mr. Arnold considered 3 in. deep enough to plough; summer fallowing he found saved a lot of labor. He did not believe in breeding heavy horses, as his experience was that he could purchase cheaper than breed when allowance was made for service of horse, loss of use of mare for a time, keep of foal, etc. The Chairman did not favor deep ploughing; after-working was of more consequence. He considered it pays to breed light stock, as there is always a demand for such horses. They could not do a good deal in the way of breeding stock or keep many sheep on 400 acres. In reply, Mr. H. Day said that sheep were profitable on a small farm; last year he reckoned the mutton consumed on his farm did not cost more than 1½d. per lb., while some of his neighbors were paying 4d. per lb. to the butcher.

Watervale, November 18.

Present—Messrs. E. W. Castine (chair), C. H. Castine, H. Beck, G. Hunter, G. Holder, H. Scovell, F. E. Sobels, H. Croft, E. Treloar (Hon. Sec.), and one visitor.

RED RUST.—Mr. Hunter tabled samples of Smart's Pioneer Purple Straw and Blue Thistle wheat badly affected by rust. Some members thought the former too far advanced for the rust to interfere with the grain, as the plant was just turning yellow; other members were of opinion that the grain would be pinched, and it was decided to leave a small portion of the crop to test the result. Mr. E. W. Castine also tabled sample of Blue Thistle wheat so badly affected by rust that the crop, which promised 23bush. per acre, is being cut for hay.

IMPACTION IN CATTLE.—Mr. Solly reported having lost another cow from "dry bible," making the fourth death in his herd. This cow jumped out of the yard, and got away without being drenched, while he was dosing the remainder. Of those that he treated none had succumbed.

DIE-BACK IN FRUIT-TREES.—Several members wished to know what was the real cause of "die-back." Various causes were mentioned, and it was thought to appear mostly on trees growing on damp soils.

Millicent, November 5.

Present—Messrs. H. F. L. Holzgrefe (chair), H. Hart, H. Warland, S. J. Stuckey, H. Oberlander, H. A. Stewart, B. Varcoe, J. Davidson, G. Mutton, and R. Campbell.

GREEN MANURE CROPS.—The Chairman of the Central Bureau inquired *re* green manure crops. Mr. Hart had grown rye and white mustard on sandy land and ploughed it in with excellent results; the seed was sown before early rains set in. Melons grew as well on this land afterwards as on new ground. The Chairman would prefer to feed off green crops, but Mr. Hart said in sandy land it was better to plough it under. Members had tried Seradilla, but it failed to germinate.

FODDER CROPS.—Members had good results from rape, mangolds, mustard, rye, turnips, swedes, and kail. Mr. Campbell tabled plants of horse beans,

grown on heavy land. Mr. Hart said there was very little land in the district suitable for this plant; where they will do they should be profitable, as they made a splendid cleaning crop. Mr. Davidson said this was largely grown in New Zealand, the beans as well as the haulms being relished by stock. Mr. Stewart said that Messrs. Smith & Stewart, of Mount Gambier, found these beans better than oats for the horses used in the mail carts. It was decided to try buckwheat next season if seed is obtainable.

FARMERS' CREAM.—Mr. B. Varcoe said that at the Congress in Adelaide Mr. Welsh, of Port Elliot, spoke of the discrepancy in weight of butter made from cream sent to the city. The explanation given was that the stale cream did not yield so much butter as that just ripe. He had heard like complaints in this neighborhood, and had tested it with the following results:—Four gallons of cream, weighing 40½lbs., seven days old, gave 21lbs. of butter; the same quantity at two days old made only 20lbs. butter, so he failed to see how the explanation fitted. The test was made last week, and the two-days-old cream made the best butter. Mr. Campbell said he had sent 48lbs. of cream to Adelaide and got returns for 9½lbs. of butter, and 28lbs. of cream from the same can made 9lbs. of butter at home. The Chairman said he had sent cream to Adelaide and it took 3½lbs. cream to make 1lb. butter; but the home churning yielded 1lb. of butter from 2½lbs. of cream. He had complained with good effect for a time, but a relapse took place. In the train coming from Adelaide he overheard two country women discussing the same question. Mr. Stuckey thought Mr. Varcoe's trial had not been extensive enough. Mr. Davidson said there was often a difference in the value of cream coming from the separator. If new cream was put with two-days-old cream, the newer would take longer to come to butter and consequently would be lost in the buttermilk.

POTATOES.—Mr. Campbell distributed sets of Professor Marcker potatoes grown from seed imported by the Chairman of the Central Bureau. It was a nice white potato, and did best in sandy land.

CHARCOAL FOR POULTRY.—Mr. Davidson read extract showing the benefit derived from giving charcoal to poultry.

MANURES FOR CEREALS.—Mr. Varcoe had manured a strip of oats with mineral super. at rate of 160lbs. per acre, but the unmanured crop on either side was superior; the land was a poor sand. The Chairman had had similar results. Mr. Stewart said experiments with oats at Rendelsham were a failure where super. at the rate of 170lbs. per acre was applied. Mr. Hart considered the land better suited for fodder crops. In years to come it might grow grain, but not yet.

Davenport, December 5.

Present—Messrs. W. J. Trembath (chair), A. McDonald, J. Holdsworth, T. Julian, J. Roberts, F. H. Pybus, T. McDowell, and J. E. Lecky (Hon. Sec.).

HOW TO IMPROVE THE BUREAU.—Considerable discussion took place on paper read by Mr. Grashy. Mr. J. E. Lecky said there was much in the paper which commended itself to his mind. He thought greater interest would be excited if the country Branches elected representatives to the Central Bureau. They would be brought into closer touch with the central organisation, and certainly would have a deeper and keener interest in it and its work. He viewed the suggestion for the organisation of reading circles as a splendid one for country Branches, and favored the establishment by the Central Bureau of a library consisting of the latest works on agriculture and industrial subjects, such library to be available for use by the country Branches. One of the greatest forces in arousing and sustaining interest in their work would be individual recognition of duty by the members, and a practical manifestation of the fact by active and ungrudging service. He favored an increase in the

number of members of the Branch. Mr. Roberts favored direct representation of country branches on the Central Bureau, the establishment of a circulating library, and remarked that a close adherence to a former rule of their Branch in the preparation of quarterly programmes of work would make the meetings more popular and prove a means of sustaining interest. Mr. McDonald agreed, and again urged the advantages to be derived from the establishment of a circulating library as advocated by him in a paper read before the Branch, and at the recent Conference at Quorn. Mr. McDowell supported the election of representatives of country branches to the Central Bureau, and the introduction of female members. The latter innovation would certainly increase interest in their meetings, and he found that women took an active and intelligent interest in subjects dealt with by the Bureau. Mr. Holdsworth spoke of the great advantages to be derived from the suggested lecture course by experts, and referred to the deep interest aroused by the visits of Professors Lowrie and Perkins and Mr. Thomson to their local branches. The latter gentleman, by his clear, concise and scientific lectures, was completely revolutionising the dairying system of the State; and the practical demonstration of vine-pruning by Professor Perkins lived in his memory. The hour devoted to that demonstration was worth a month's unaided reading on the subject. The trend of education to-day was in the direction of "object lessons," and if some systematic method of securing periodical visits from these experts could be arranged, the interest of members in branch work would be ensured. He favored an increase of branch membership. The Chairman agreed in the main with Mr. Grashy, and would support reconstruction of the Central Bureau on the lines suggested by the Hon. Secretary. He believed that if the Branches were empowered to elect representatives to the Central Bureau it would give them a newer and keener interest in the work of that important body. Special lecture courses, the establishment of Branch libraries and museums, periodical exhibitions, and, above all, a membership infused with a deep sense of their individual responsibilities and duties and a determination to devote their best thought and intelligence in shouldering their responsibilities and performing their duties, had formed the texts upon which he had built his annual address for the past five years, and still claimed his support and advocacy. Of course they were bound to recognise that a series of bad seasons had prevented a continuance of those monthly exhibitions of produce which marked and excited interest in their work during the "fat years," and that members had become listless and disheartened as a consequence. He held broad views on the question of female enfranchisement, and was assured that their admission to membership of Branches would prove an attraction to some male members at least. They certainly could claim intelligence, and some of them were gifted with special qualifications for scientific research, and a love of experimental work in garden and field. For some time he had recognised that the limitation of membership was not good, he believed the removal of the limitation would lead to increased usefulness. He felt sure the suggestion that the increased cost to Government of supplying members with *The Journal of Agriculture* would prove a bar to the proposed change would not receive consideration for a moment, as the extension of their work, and larger circulation of *The Journal* would only be a further means of ensuring more speedily and effectively the consummation of the objects for which the Bureau was established. It was unanimously decided to support the removal of the existing limitation to membership.

ENSILAGE.—Mr. McDowell initiated a discussion on this subject, and described the process of making ensilage as seen at the Victorian Government Farm. A brief discussion ensued, the opinion being expressed that more could be done in this way to preserve fodder for stock in good seasons to provide for seasons of scarcity.

Eudunda, November 25.

Present—Messrs. C. Wainwright (chair), W. F. Sieber, A. M. Twartz, H. D. Weil, F. W. Paech, J. A. Pfitzner, W. H. Marshall (Hon. Sec.), and two visitors.

"JOURNAL" PAPERS.—The Hon. Secretary read from *Journal of Agriculture* paper read at Kapunda Branch by Mr. Banyer on "A Grain of Wheat"; also paper read at Millicent Branch annual meeting on "Poultry." Both papers were freely discussed by members.

Gladstone, December 2.

Present—Messrs. J. Gallasch (chair), C. Gallasch, D. Gordon, J. Milne, J. Sargent, and C. Goode (Hon. Sec.).

HAY.—At previous meeting the question of salting hay was discussed. Members agreed that the practice of salting during stacking would improve its quality and tend to preserve it in good condition. Some members had tried dry salting without much success, as the salt remained in the stack undissolved. It was thought that this might answer in damp weather, but the better method was to dissolve the salt in water and sprinkle the hay when stacking. The drawback to salting is the time lost in stacking the hay.

RED RUST.—In view of the losses sustained by individuals and by the State through the ravages of rust, members are of opinion that rust-resisting wheat should be more extensively grown, and it was resolved that the Central Bureau be requested to ascertain and publish information concerning the varieties of wheat of good quality that are resistant of rust, also where seed of these varieties can be obtained. [Will members of Branch please discuss this matter in connection with resolution passed at meeting of Central Bureau held on December 16.—GEN. SEC.]

TICK ON POULTRY.—Mr. Sargent asked for cure for this trouble. The Hon. Secretary had found that dipping the fowls in strong solution of tobacco was effective. He boiled $\frac{1}{2}$ lb. of black stick in 4 galls. of water and used it lukewarm. He immersed the fowls all but the head. The feathers require to be thoroughly saturated.

Tanunda, November 21.

Present—Messrs. J. Gurr (chair), G. Mann, M. T. Ellis, T. Brock, T. Sage, W. Liddiard, and C. Heinemann (Hon. Sec.).

OLIVES.—Mr. Liddiard read a paper on this subject to the following effect:—

Up to the present the growing of olives in Australia had not received the attention that it warranted. In South Australia the olive grew well, and he thought that the olive and the vine could be worked together. The olives could be planted around the headlands of the vineyard or orchard; they would make a splendid breakwind, and, in affording protection against stormy winds, would pay for the land they occupy. If planted 30 ft. apart round an eighty-acre section there would be 243 trees; putting the income at 3s. per tree, this would give a return of £34 9s. off the headlands which would otherwise be lying idle. Olives were not difficult to raise either from seed, cuttings, or truncheons. Seedlings, of course, would require to be worked to the variety desired. The grower has to wait seven or eight years before he will get any return from his olive trees, but they waited quite as long for other trees to yield. It would not be expensive for a winemaker to make olive-oil, as a lot of his appliances would come in handy for both operations. The olive tree has proved itself a source of great wealth in those parts of Europe where it thrives, and he did not see why we should not make it do the same here, as they had abundant evidence that our climate and soils were suitable.

Some discussion ensued, but members were doubtful whether it would pay to grow olives here, as the expense of picking was too high.

HOW TO GROW CELERY WITHOUT EARTHING-UP.—The Hon. Secretary read the following paper:—

As growing celery for the market is a tedious and troublesome work it is not gone in for to any extent in our locality. Some have tried it and not succeeded well enough to continue. The earthing-up requires a lot of work and attention, and generally through the soil being sticky it discolors the stalks. By the use of boards, however, this can be remedied. Sow the seeds thickly in shallow boxes under shade; when large enough transplant in larger ones in rows outdoors, and keep well watered until large enough to plant in the garden. Prepare the soil with old rotten manure from the barnyard; plough in and thoroughly harrow, then stake out the rows 3ft. apart and rake the ground fine and leave a little hollow where the rows should come. Wet the ground well and lay a board about 6in. wide where you want the rows; get the box with plants and well wet them. Cut with a knife between the plants and take them out, then make a row of holes each side of the board 6in. apart and plant and water well if there is no rain. The hollow left is for watering, and should have a slight fall. When the plants are about 6in. high put up boards 18in. high on each side of the rows 1ft. apart; now put long barnyard manure between the boards about 4in. deep; tramp down well. This plan does not need much water on account of this mulching, and the water will soak through the mulching down into the hollow where the plants are. When the leaves are well out of the boards, or about 2ft. high, close the boards in at the top and in a week or so the bleaching is done. By this plan you have beautiful clean and tender celery.

TRELLISING VINES.—Members condemned the Sylvoz Cordon, being of opinion that the vines would be worn out in eight years. The Bordelais system was favored.

Arthurton, November 22.

Present—Messrs. W. H. Hawke (chair), W. Short, M. Lomman, J. Koch, J. B. Rowe, J. Pearson, M. Baldock, H. Baldock, W. E. Hawke, H. J. Freeman, S. T. Lamshed, J. Welsh, L. Crosby, C. L. Palm (Hon. Sec.), and a number of visitors.

WHEAT EXPERIMENTS.—Meeting was held at the Chairman's residence, a large number of farmers availing themselves of the opportunity of seeing the results of Mr. Hawke's experiments with wheats. Mr. Hawke has for several years been selecting and testing wheats with a view to obtaining a good early variety for ordinary sowing, and a medium solid-strawed wheat for seeding with oats for hay crop. Owing to the freedom from rust during past ten years the quality of rust-resistance has been largely overlooked. Thirty-eight small plots of wheat growing in garden land which had received 2cwts. of super. per acre were inspected, besides a number of smaller lots of new medium solid-straw wheats. The plots were in the shelter of mallee scrub and a double row of gum trees, and rust appeared worse here than in the same varieties in the open. Most of the rows were badly affected by rust, some only slightly affected, and a few quite free. The crops generally in this locality are more or less affected by rust, and it is expected that the average will be reduced one-half. One of the wheats raised by Mr. Hawke, named Gamma, is free from rust this year and yielding well. Considerable areas of it have been grown in the district.

Cherry Gardens, December 10.

Present—Messrs. R. Gibbins (chair), T. Jacobs, C. Lewis, G. Brumby, J. Lewis, A. Broadbent, J. Richards, J. Metcalf, G. Hicks, T. Partridge, and W. B. Burpee.

IMPROVING THE WORK OF THE BUREAU.—Mr. Grasby's paper on this subject was discussed. Members do not advise any increase in the membership of Branches. In order to improve the meetings of the Branch it was suggested that members take it in turn to write short papers on some practical subjects.

RED RUST.—Mr. Burpee tabled wheat badly affected by rust. Rust has made its appearance in this district during past few weeks, being worse than for many years past.

WEED.—Mr. Jacobs called attention to the spread of the star thistle in this locality, and suggested that steps should be taken to check it.

ANNUAL REPORT.—During the year twelve meetings of the Branch have been held, the average attendance being nine. Only two papers have been read during the year. [Plenty room for improvement in this direction. —**GEN. SEC.**] Votes of thanks were accorded to the retiring officers. Mr. Burpee was elected Chairman and Mr. C. Ricks re-elected Hon. Secretary for the ensuing year.

Strathalbyn, November 25.

Present—Messrs. M. Rankine (chair), D. Gooch, P. McAnaney, G. Sissons, R. Watt, J. M. Meikle, G. J. Reed, B. Smith, A. Rankine, and J. Cheriton (Hon. Sec.).

PLANT FOOD.—Paper read at Annual Congress by Mr. J. H. Snell on this subject was well discussed, and it was agreed that most of the contentions of the writer were fully justified.

RED RUST.—The Chairman read the following paper on this subject:—

We are now experiencing a visitation of red rust such as the district has not known for more than thirty years. That it will have a most injurious effect on the yield and sample of wheat is a certainty. The farmers who suffered from rust in 1867 and 1870 have a feeling remembrance of those years. We have had occasional visitations of rust since that period, but comparatively slight and not general; consequently many farmers are hopeful that the outlook at present will not be very serious, judging from their more recent experience. A much larger quantity of wheat is now being cut for hay than would otherwise have been gathered, and it is to be feared that some of it will not be first class. I have been watching with a good deal of interest the progress of the rust during the last ten days and the rapidity with which it has spread. I noticed in an affected crop cut with the binder that the sheaves after being stacked for a few days appeared to be quite clean on the outside, but on examining the centre it was clearly seen that rust had made great progress since being bound up in a green condition. I have therefore come to the conclusion that a crop showing rust should be cut down with the mower, and left for a few days to bleach before being raked up. I have for your inspection four samples of hay—two from a crop just showing signs of rust; one sample from the outside of a sheaf being good sound hay; No. 2 from the centre of sheaf which shows how rapid is the progress of rust when the crop is in a soft green condition and unexposed to the sun and air to kill the germs of rust. The other two samples were taken from a crop in a worse condition; No. 1 sample was taken from an untied sheaf thrown out of the binder; No. 2 taken from the centre of a sheaf, which shows most clearly the benefit of exposure in preserving the quality of the hay. As to the cause of red rust, I believe that a superabundance of moisture when the wheat plant is in ear, with even moderate heat, produces an unhealthy condition in the plant; consequently disease will follow. Many farmers think that the unusually heavy rain in October is the immediate cause of the rust. Should such be the case it ought to be a warning to farmers to be prepared for a like visitation, either by cutting the hay in time, even if considered a little too green, or by cultivating an early kind of wheat, for we have positive proof this season that the early wheats have suffered but little if any from rust.

Johnsburg, November 23.

Present—Messrs. T. Potter (chair), L. Chalmers, P. Caughlan, J. R. Masters, J. Sparks, and T. Johnson (Hon. Sec.).

WATERING STOCK AT OPEN DAMS.—Mr. Caughlan read a short paper on this subject. He had noticed that when a number of milch cattle are watered at an open dam the milk quickly became tainted, and the butter also suffers. It would be better to enclose the dams and fit up some appliances for raising the water. A lot of filth must accumulate in the dam when cattle are allowed

to wade in to drink. He would like to know if other farmers had noticed the milk affected from this cause. Members considered this a most important subject. It was stated that milk was frequently tainted from the cause indicated. The accumulation of filth in the dams was very noticeable when the water got low, and the drinking of such water must have an injurious effect upon the health of stock. Some members agreed as to necessity for fencing dams and watering in troughs but the Chairman referred to the necessity for occasionally puddling the bottoms of the dams, which was done by stock if allowed in.

EARLY WHEATS.—Mr. Sparks asked if there were any early Purple Straw wheats that could be grown here. They wanted something earlier than the ordinary Purple Straw; the Steinwedel would be suitable but for shaking out so badly. Mr. Chalmers some years ago grew African Bearded No. 1, and found it the best wheat for this district that he had ever grown. It was early, grew rapidly during a spell of dry weather, and yielded well, the berry being long. He had lost the wheat, but would be glad to get it again.

LUCERN.—The Hon. Secretary asked whether lucern could be grown successfully in this district. It would be of immense value for keeping pigs and poultry in good condition. [Unless irrigated lucern would not thrive in this locality.—GEN. SEC.]

STRANGLES.—Stock Inspector Winkler has visited the district to inquire into the epidemic of strangles that occurred. The disease has apparently run its course, and stock are now healthy.

Onetree Hill, December 20.

Present—Messrs. J. Bowman (chair), A. Adams, F. Bowman, A. Thomas, and J. Lucas (Hon. Sec.).

TAKEALL.—This trouble does not affect wheat much in the hills here, possibly owing to uniform rainfall. It has been found that with late spring ploughing and summer fallowing the crops are not so free as when the land is winter fallowed.

IMPROVING WORK OF BUREAU.—Discussion on this subject took place. Members considered it difficult to devise means to secure a better attendance at Branch meetings. An annual social, when a *resumé* of the year's proceedings could be presented and opinions freely exchanged, was suggested. Members were undecided on the question of increasing the membership of Branches.

RED RUST.—This disease has not done so much harm in the district as was feared. Early sown and early maturing varieties seem to have suffered most. King's Early was particularly bad. Majestic appeared to be quite free; it was a slow growing wheat, excellent for hay, and a good yielding variety.

Koolunga, December 19.

Present—Messrs. T. B. Butcher (chair), R. Palmer, E. J. Shipway, G. Jose, G. Cooper, J. Sandow, T. Freeman, J. Button, R. Lawry, J. C. Noack (Hon. Sec.), and one visitor.

STANDARD SAMPLE OF WHEAT.—This question was fully discussed, members generally being of opinion that the standard should be maintained as high as possible for the sake of the reputation of our wheats.

TAKEALL.—Circular from General Secretary *re* "Takeall" was discussed. This district is not much troubled by this disease. Members generally agreed that it was worse during a wet winter following dry ploughing; that heavy land and land fallowed late suffered most. Broadcast and unmanured crops suffered more than drilled. Rolling after sowing was considered to have a beneficial effect.

AGRICULTURAL PLOTS—Messrs. T. B. Butcher and G. Cooper, who were appointed judges of the experimental plots for which a certificate was offered by the Branch, reported fully on the results of their inspection. The plots of Messrs. J. Sandow, and J. Button came in for very favorable comment, each having about a dozen varieties of wheat under trial. The certificate for the best plots was awarded to Mr. Sandow.

Crystal Brook, November 30.

Present—Messrs. J. C. Symons (chair), J. Bryson, G. Davidson, P. Pavy, E. Dabinett, W. J. Venning, A. Hamlyn, M. Weston, W. Natt, F. E. Fischer, and F. S. Keen (Hon. Sec.).

CONFERENCE OF NORTHERN BRANCHES.—It was decided that the annual Conference be held early in February, 1902, and to invite all the Northern Branches to co-operate.

BINDER v. STRIPPER.—Mr. Venning read a paper on "Farmer's Aims." He also read from *Journal of Agriculture* on the alleged benefits from cutting wheat with the binder instead of leaving it for the stripper. He did not agree with this, however, as in our dry climate wheat ripens too rapidly for the binder to be used advantageously. Mr. Hamlyn thought this an open question, as in some seasons the wheat will take a fortnight to ripen after turning yellow, while in others it ripens in two or three days.

ROTATION OF CROPS.—Some members did not think wheat would do well after barley, while others thought it would.

RED RUST.—Mr. Venning stated that he had noticed that when heavy rains fell during the summer months red rust invariably appeared in the crops during the season following. Mr. Hamlyn said this point has also come under his notice. Mr. Weston said Mr. Claridge had informed him that he had been carrying out experiments with different wheats in his garden, and he found that if water is applied to the plants during the hot weather rust follows, and he attributed it to the steamy conditions arising from the application of water to the hot soil. Other members thought that the rain following a dry warm spell of weather caused an excessive flow of sap, which escapes and forms rust. [This idea is not correct. Rust is known to be a fungus, and its life history has been fully traced. Almost all fungi require moisture and warmth to develop fully. Is it not a fact that when we have showery weather during the spring we have also red rust?—GEN. SEC.]

SOUTH AUSTRALIAN RAILWAYS.

Parcels and Passengers' Luggage.

COLLECTION AND DELIVERY AT ADELAIDE, PORT ADELAIDE, AND GLENELG.

The attention of passengers is called to the fact that the Railway Department collects and delivers all parcels and luggage in Adelaide, Port Adelaide, and Glenelg, or in the suburbs mentioned below, thus avoiding inconvenience and loss of time to passengers. Such parcels and luggage will not, however, be accepted for delivery on board any vessel lying at Port Adelaide, but passengers claiming their luggage at that station can have it carted to the wharves or sheds where vessels are loading.

The charges for collection or delivery are as follows :—	In Adelaide, Port Adelaide, or Glenelg.	To or from any of the undermentioned Suburbs.
	<i>s. d.</i>	<i>s. d.</i>
<i>* Luggage.</i>		
For each package not exceeding 28lbs.	0 3	0 6
For each package exceeding 28lbs., but not exceeding 112lbs.	0 6	1 0
For every additional 112lbs., or part thereof, per package ..	0 6	1 0
<i>Parcels.</i>		
For each parcel not exceeding 14lbs. in weight	0 3	0 6
For each parcel exceeding 14lbs. but not exceeding 56lbs. ..	0 6	1 0
For every additional 56lbs., or part thereof, per package	0 6	1 0

* Charges to be made on the aggregate weight when luggage belongs to one person.

Delivery carts leave the Adelaide Station on week-days at 9 a.m., 11 a.m., 2 p.m., and 4.30 p.m., for delivery within the municipal boundary of Adelaide; and for delivery in the suburbs at 2.15 p.m.; at Port Adelaide as often as may be required between the hours of 8.0 a.m. and 6.0 p.m.

Special attention will be given to this service in order to ensure prompt and safe delivery. Unless parcels received in Adelaide and Port Adelaide are addressed "To be left till called for," the Department will deliver at above rates.

Suburbs to which the Collection and Delivery Service Extends.

Adelaide Municipality—Clarence Park, College Park, College Town, Eastwood, East Adelaide, Frewville, Gilberton, Goodwood, Hackney, Hyde Park, Hilton, Kenilworth, Kensington, Keswick, Kent Town, Malvern, Medindie, Mile End, Norwood, Parkside, Portland, Prospect, Rose Park, Rosewater, Stepney, Southwark, Thebarton, Unley, Unley Park, Victoria Park, Walkerville.

Port Adelaide Municipality—Birkenhead.

Glenelg—Somerton.

Notice to Passengers.

If you require your luggage delivered by the Department, either in Adelaide, Port Adelaide, or in any of the above-mentioned suburbs, have it fully addressed, and hand it to the stationmaster at the station where you begin your journey, who will arrange to forward it.

PARCELS RATES.

Any distance not exceeding—	Weight not exceeding								For each additional 14lbs or part thereof.					
	7lbs.		14lbs.		28lbs.		56lbs.			84lbs.		112lbs.		
	s.	d.	s.	d.	s.	d.	s.	d.		s.	d.	s.	d.	
10 miles	0	6	0	6	0	6	0	8	1	0	1	4	0	2
20 "	0	5	0	6	0	6	1	0	1	6	2	0	0	3
40 "	0	6	0	6	0	8	1	4	2	0	2	8	0	4
60 "	0	6	0	6	0	10	1	8	2	6	3	4	0	5
80 "	0	6	0	6	1	0	2	0	3	0	4	0	0	6
100 "	0	6	0	7	1	2	2	4	3	6	4	8	0	7
140 "	0	6	0	8	1	4	2	8	4	0	5	4	0	8
180 "	0	6	0	9	1	6	3	0	4	6	6	0	0	9
220 "	0	6	0	10	1	8	3	4	5	0	6	8	0	10
260 "	0	6	0	11	1	10	3	8	5	6	7	4	0	11
300 "	0	6	1	0	2	0	4	0	6	0	8	0	1	0
For each additional 50 miles or part thereof	—		0 1		0 2		0 4		0 6		0 8		0 1	

When two or more parcels are consigned to one person the above rates are charged on each parcel separately.

Parcels addressed "Murray Street Terminus, Gawler," "To be called for," may be booked at station to station rates.

Fresh meat, butcher's small goods, and fresh fish (when in baskets or boxes, or packed in bagging or calico), butter, eggs, dead poultry, game, mushrooms, cut flowers, ice in boxes or bags, and South Australian fresh fruit are carried at half parcel rates; minimum charge 6d. This applies also over Silverton Tramway. Unless such packages are marked "Till called for" they will be delivered in Adelaide and Port Adelaide at the following rates:—Not exceeding 14lbs., 3d.; not exceeding 56lbs., 6d.; not exceeding 112lbs., 9d.; not exceeding 224lbs., 1s. 3d.; not exceeding 336lbs., 1s. 9d.; for each subsequent 112lbs., or part thereof, 3d. The South Australian rail and delivery charges are to be calculated on the aggregate weight of each consignment, and the latter charges must be doubled for delivery outside the city but within a radius of two miles of the General Post Office.

All fish, fruit, meat, poultry, and other perishable articles are conveyed at owners' risk, and are liable to immediate sale if not claimed and charges paid on arrival.

Packed parcels in hampers, crates, bags, cases, or other packages are charged quadruple parcel rates, and the onus of proving that the parcels are not packed rests with the consignees or consignors.

The Railways Commissioner will not be accountable for any parcel above the value of £5, unless the nature and value of the articles or property contained in such parcel shall have been declared by the sender, and an insurance rate equal to 1 per centum upon such declared value shall have been paid, in addition to the amount chargeable by the foregoing scale of rates.

Feathers, furniture, glass, hats, bonnet and hat boxes, cases of millinery, straw bonnets, mirrors, musical instruments, sulkies in pieces, pictures, sewing-machines, wickerwork, wire cages, or other articles light or fragile, are charged 50 per cent. above parcels rate (Port and Glenelg lines excepted).

Returned empties, actual weight, single rate, must be prepaid.

Parcels which are intended to be booked by any particular train must be delivered at the forwarding station at least fifteen minutes previous to its departure; otherwise they may be detained until the departure of the following train.

Parcels waybilled, and addressed "To be left till called for" at the chief stations, will, if not called for within forty-eight hours thereafter, be subject to the same charges and regulations as left luggage.

The Railways Commissioner will not be responsible for the loss of, or damage to, any goods or parcels addressed "To be left till called for."

No live small animal or bird will be received for carriage by railway unless confined in a proper coop or case, and the stationmasters and guards will be authorised to refuse any coop or case which, in their judgment, is too small for the purpose to which it is put, or, being fit, is so overcrowded as to cause needless suffering to the birds or animals it contains.

PARCELS FOR OCEAN STEAMERS.

For an additional charge of 1s. for each 56lbs., or part thereof, parcels will be placed on board ocean steamers at Largs Bay.

CREAM AND MILK.

These will be carried, at owners' risk only, in the brake-vans of passenger trains at the rates and subject to the conditions following:—

Not exceeding 25 miles	½d. per gallon
For each additional 25 miles, or part thereof	½d. "
Minimum charge	6d.

Skimmed milk from butter and cheese factories, to which it has previously been carried by rail as fresh milk:—

Not exceeding 25 miles	½d. per gallon
For each additional 25 miles, or part thereof	½d. "
Minimum charge	3d. "

Cream and milk will only be received in properly constructed drums, which must be quite water-tight. Each drum must be impressed with its capacity in gallons, and with the names of the owner and station.

The charge will be made upon the capacity impressed upon the drum.

Empty return drums, 1d. for each consignment of 28lbs. or part thereof for each 100 miles or part thereof.

COOL CHAMBERS.

During the hot season cool chambers run as under:—

Between Adelaide and Broken Hill.

From Adelaide on Tuesdays and Thursdays, at 5.30 a.m.
From Broken Hill on Wednesdays and Fridays, at 8.10 a.m.

Between Port Pirie and Broken Hill.

From Port Pirie on Mondays and Thursdays, at 6.50 a.m.
From Broken Hill on Tuesdays and Fridays, at 8.10 a.m.

Between Adelaide and Quorn.

From Quorn on Mondays and Thursdays, at 8.18 a.m.

Between Adelaide and Moonta.

From Adelaide on Wednesdays and Mondays, at 7.40 a.m.
From Moonta on Thursdays and Tuesdays, at 6.25 a.m.

Between Adelaide and Port Pirie via Blyth.

From Adelaide on Tuesdays and Fridays, at 5.30 a.m.
From Port Pirie on Thursdays and Mondays, at 9.28 a.m.

Between Adelaide and Mount Gambier.

From Mount Gambier on Tuesdays and Thursdays, at 7 a.m.

Between Adelaide and Eudunda.

From Adelaide on Wednesdays and Saturdays, at 11.50 a.m.

From Eudunda on Thursdays and Mondays, at 10.20 a.m.

Between Adelaide and Milang.

From Adelaide on Mondays and Thursdays, at 7.30 a.m.

From Milang on the same days, at 2.40 p.m.

From Quorn to Hergott Springs.

On each Saturday, at 8.34 a.m.

Packages of butter only will be received for conveyance by these chambers, but must be so marked.

Goods forwarded in the cool chambers will be charged half parcels rates, minimum 6d.

DELIVERY CHARGES, FREEZING DEPOT, PORT ADELAIDE.

On packages sent by passenger train:—

For each consignment not exceeding	14lbs.	.....	3d.
“ “ “	56lbs.	.....	6d.
“ “ “	112lbs.	.....	9d.
“ “ “	224lbs.	.....	1s. 3d.
“ “ “	336lbs.	.....	1s. 9d.

Each subsequent 112lbs. or part thereof..... 3d.

Carriage and delivery charge must be prepaid.

PARCELS DELIVERY, COUNTRY TOWNS.

Parcels, *unless* directed “*To be left till called for,*” will be delivered within the municipal boundaries of Gawler, Kapunda, Port Augusta, Wallaroo, and Moonta at the following rates:—Parcels up to 112lbs., 6d.; above 112lbs. and not exceeding 196lbs., 1s.; above 196lbs., 1s. 6d.; Mount Gambier, irrespective of weight, 3d.



INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

Number of Persons Registered and Found Employment by Government Departments and Private Employers from November 29 to December 23, 1901.

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youths	68	102	217
Masons and bricklayers	2	4	4
Stonecutters	1	1	—
Carpenters	8	—	4
Boilermakers and assistants	7	—	1
Blacksmiths and strikers	1	1	—
Fitter and turner	4	1	—
Enginedriver and fireman	3	1	—
Moulders	—	2	—
Patternmakers	2	—	—
Master mariner and deck hands	—	1	3
Shipwright	—	—	1
Plumber	—	—	1
Compositor	—	—	1
Crossing keeper	—	—	1
Fencer	—	—	1
Wattle strippers and farm hands	—	—	3
Cook	1	—	—
Warder	1	—	—
Female attendant	—	—	—
Apprentices	3	1	1
Cleaners	8	3	—
Porters and junior porters	9	1	—
Totals	118	118	238

December 23, 1901.

A. RICHARDSON, Bureau Clerk.

Common Sense and Justice v. Strikes and Lockouts.

An important Conference on conciliation and arbitration was held in Chicago in December of last year, under the auspices of the National Civic Federation. That Conference made certain recommendations—first, that employes and wage-earners should enter into annual or semi-annual agreements; second, that all industries should establish boards of conciliation; and third, that, as compulsory arbitration is not at this time a practical question, a national committee should be formed of representatives of employers and employed for the purpose of formulating a plan looking to the establishment of a general system of conciliation for the promotion of industrial peace, on the principle that arbitration and conciliation should take place not after, but before the beginning of lockouts and strikes.

The committee thus appointed met in New York last May. Besides other members there were present thirteen representatives of labor organisations and thirteen representatives of employing organisations.

The committee put forth an admirable statement of purpose and scope, in which it strongly recommended "full and frank conference between employers and workmen, and with the avowed purpose of reaching an agreement as to terms of employment." It very especially insisted upon trade agreements for a definite term.

At a large public meeting which took place in the historic precincts of Cooper Union, under the auspices of the People's Institute, addresses were made by labor representatives as prominent as Mr. Gompers and Mr. Mitchell, and by representatives of employers like Mr. Justi and Mr. Sayward, secretary of the National Association of Builders. A significant incident of this popular indorsement of the movement by New York wage-earners was the opposition of a small but noisy group of irreconcilables.

A few years ago such a demonstration in favor of peace and goodwill between capital and labor would have been impossible. The industrial millenium is not yet. There are tyrannous methods on the part of trades unions which must be eliminated in a free country; there are underhanded proceedings on the part of the agents of capital that are not only dishonorable, but dangerous to the interests of permanent peace; there are ignorance and cruelty among employers in certain districts and in some branches of manufacture, though in other branches there is a quickening of the conscience and an eagerness to see that the worker has something "more than wages."

Strikes and lockouts are well nigh as clumsy and cruel as the duel and the ordeal by fire. The ordeal by fire has gone; the duel is disappearing in most civilised countries. Let us hope that strikes and lockouts will, in enlightened communities, become, before very long, only a part of the melancholy history of days that are gone.—*Century Magazine*.



Journal of Agriculture

AND

Industry.

No. 7. REGISTERED AS FEBRUARY 1, 1902. [A NEWSPAPER. VOL. V.

NOTES AND COMMENTS.

The weather during the past month has been distinctly unseasonable. We have experienced none of the hot spells usual to this season of the year, weather changes following one another in rapid succession. On the 21st probably the record duststorm was experienced on the Adelaide plains and elsewhere, and the continuous strong dry wind worked havoc with fruit trees, vines, &c. In many places the already sparse crops of apples were still further reduced, and it is feared that the grape crop will be seriously affected in many vineyards owing to the foliage having been scorched. It is not uncommon to see trees and vines which look as though a fire had been in close proximity to them, the leaves being quite brown and dry. Although the weather during the month has been cooler than the average, very little rain has fallen, and water is scarce in many districts.

The *Ballarat Courier* reports that a few years ago Mr. James Long obtained from Adelaide and liberated in his gardens at Glen Park a dozen goldfinches. A few days later they disappeared, to his great disappointment; but recently they and their progeny returned in great numbers and took possession of the trees in Glen Park, to Mr. Long's delight. If the finches increase in numbers at the same rate as they do around Adelaide and become as mischievous, there is little doubt that if Mr. Long himself does not soon regret his action his neighbors will at any rate not thank him for adding to the number of feathered pests. Round Adelaide the finches have in many parts become a perfect nuisance, destroying all sorts of flowers to get at the seeds. They increase very rapidly and appear well able to hold their own. Fortunately up to the present they have not taken to fruit-eating.

The standard f.a.q sample of South Australian wheat for season 1901 has been fixed by the Chamber of Commerce at 62lbs. per imperial bushel. The delay in fixing the standard has been severely commented on by many farmers, who contend that the wheatbuyers knew before the harvest was well advanced that, owing to rust and hot winds, the sample would not be equal to last season, yet wheat going 62lbs. per bushel was docked by the buyers, who purchased on the previous year's standard of 63lbs. In many cases this means

a serious loss to farmers, especially in the early districts, and it is not difficult to understand that they view with suspicion the statement that a high standard is to their benefit, especially when they see Victorian wheat at an equal or even higher price with a lower standard than South Australian.

Samples of new wheat are sometimes sent by farmers to the Agricultural Bureau for advice as to their milling qualities. As the Bureau has no means of testing them it is useless for farmers to send samples to the office for that purpose. Some years ago the Minister of Agriculture purchased a small mill specially designed for testing parcels of wheat under regular milling conditions, but this has never been utilised. The mill is still at the Agricultural College, and as the Acting Principal has furnished the Hon. Minister with estimates of cost of erecting and working it, possibly something may be done in the near future to afford farmers an opportunity of having the milling qualities of new kinds of wheat tested under expert supervision.

Professor Henry, of the Wisconsin (U.S.A.) Agricultural Experiment Station, reports on the feeding value of wheat in the fattening of lambs. The lambs averaged 85lbs. each, and the test extended over a period of ninety-one days. It was found that it required 553lbs. of wheat and 552lbs. of hay to produce 100lbs. extra weight in the lambs, the average daily gain per sheep being 0·25lbs. Maize was found to give a better result, requiring less corn to produce the same increase in weight, while the daily gain was also somewhat higher. Corn is considered to be better fattening food, and wheat better for growth. Professor Henry considers that for sheep wheat would probably be equal in value to maize, as the matured sheep would utilise the wheat more freely to build fat with.

The value of rape on wheat-sick lands has frequently been referred to in this *Journal*, and it is a matter for surprise that so few South Australian farmers take advantage of the proved value of this plant. The *Australasian* gives some particulars of success with rape achieved by Mr. F. Parker, near Ballarat, who sows $\frac{1}{2}$ bush. of oats with 4lbs. to 5lbs. of rape per acre on stubble land in February, the surface being well broken by means of disc harrows or cultivators. With good early rains the field can be stocked within ten or twelve weeks. On twenty-six acres Mr. Parker topped up 130 forward store sheep in a month; then, soon after, put on 150 sheep, but the rape outgrew the demands of this lot, so sixty-three head of cattle, mostly young stock, were run with the sheep. These results are above the average, but that is no reason why the practice should not be more largely adopted. The growing of rape before a wheat crop is distinctly beneficial to the latter apart from the direct profits derived from the rape.

The first issue of the *Journal of Agriculture* of Victoria is to hand. With this we now have all the Australasian Agricultural Departments issuing official journals for the instruction of the cultivators of the soil. Mr. H. W. Potts, F.C.S., is the editor of the new journal, and with the large number of well-informed officers attached to the Department of Agriculture of Victoria it

should take a leading place amongst similar publications. As no particulars are given of any charge being fixed for this journal presumably Victorian producers are not being asked to pay for the information contained therein.

Last season the exports of butter from Australia to London totalled 15,369 tons, of which Victoria sent 11,351 tons New South Wales 3,655 tons, and South Australia 363 tons. This year conditions throughout the States have been decidedly unfavorable for the dairymen, and the exports show a very marked falling off. It is doubtful whether the total exports will this year reach 8,000 tons; South Australia's total has fallen to 85 tons. This must be regarded as a serious misfortune, as our competitors on the British markets, and especially those newly in the field, have the opportunity of supplying our regular customers, with the possibility of permanently securing some portion at least of them.

During the past twenty years a number of mechanical milkers have been introduced with a view to lessening the labor attached to the milking of cows, and although several of them have been favorably reported upon by independent experts and have been introduced into numbers of large dairies, they have apparently failed to stand the test of practical work. The latest introduction in this line is the Lawrence-Kennedy milking machine, which appears to be a great improvement on previous efforts. It has already been introduced into several dairies in the neighboring States and is giving great satisfaction. Though costly in the first place, the machine does not require a great deal of attention, one man and one boy being sufficient in the milk shed to attend to twenty-five to thirty cows. From fifty cows milked by machine and then hand stripped only 2½ galls. of strippings were obtained. If the machine fulfils its promise it will unquestionably have solved the dairyman's bugbear, *i.e.*, the labor problem.

Sundry complaints have been made respecting the ravages of the so-called Rutherglen fly pest. This pest, which is not a fly at all, but a small plant bug, is, like the poor, "always with us." It occurs in injurious numbers at varying places in the State pretty well every spring or early summer. It is very partial to dense vegetation, and usually breeds into destructive numbers in weedy headlands. The only well-tested spray remedy yet found effective is benzole; but in the present form the price of this chemical renders its use prohibitive over large areas. It can be used, however, on ripening fruits, as it evaporates rapidly, leaving no taint upon the fruits.

Those growers who object to the Government taking any action to prevent the spread of the codlin moth frequently state that the insect has been known in England for years, but no notice is taken of it, and the fruit infested by the caterpillar is sold without restriction. Mr. W. P. Wright, a well-known authority in the south of England, in his useful little book called "Pictorial Practical Fruit-growing," says, "This is far the worst enemy which has had to be dealt with during the past few years. I have seen hundreds of pounds worth of fruit destroyed by it. *In most instances the grower looked on complaining, but doing nothing.*" This does not look as though no notice was taken of it in England. The latter portion of these remarks reads almost as though it applied to some parts of South Australia instead of England.

THE PROFESSOR OF AGRICULTURE.

Professor J. D. Towar, B.Sc., of Michigan, United States of America, has been appointed Professor of Agriculture and Principal of the Roseworthy Agricultural College in succession to Professor Lowrie, who resigned his position last September.

Professor Towar was born in 1863, and graduated at the Michigan Agricultural College in 1885. For six years he had charge of a 500-acre farm, and in 1891 was appointed Assistant Agriculturist to the Rhode Island Experiment Station, being later on appointed Associate Professor of Agriculture, in which capacity he had five years' experience in the teaching of agriculture. For the past three years he has been Agriculturist to the Michigan Experiment Station.

It will be seen, therefore, that South Australia has secured a man thoroughly trained both in teaching the science of agriculture and in practical and experimental farm work, and as he comes with very high recommendations from prominent American agricultural authorities, there is little doubt he will be successful in South Australia. Professor Towar has had considerable experience in lecturing at the farmers' institutes, the famous American organisation somewhat similar in its objects and constitution to the Agricultural Bureau of South Australia.

Professor Towar expects to reach Adelaide early in May, and his arrival will be looked forward to with considerable interest by South Australian farmers.

ROSEWORTHY AGRICULTURAL COLLEGE.

Notes on Farm Returns, 1901-2.

BY ARTHUR J. PERKINS, ACTING PRINCIPAL.

The returns are by no means as favorable as those obtained during the preceding season. I believe, however, that on the whole they exceed Professor Lowrie's anticipations formed in the earlier part of the season before he left for New Zealand. Since that period we had the benefit—and the disadvantage in the form of an extended development of red rust—of copious summer showers. Unquestionably the advantages outbalanced the disadvantages.

The general average of the total area reaped for wheat, viz., 169 acres, attained to 19bush. 45lbs., as against last season's 24bush. or 25bush. What oats were cut for grain yielded 28bush. 39lbs., and they were by no means the most favorable plot. Oats in the "Island" that were cut for hay would in all probability have exceeded 40bush.

Two hundred and sixty-four acres of wheat were cut for hay, yielding about 1 ton 12cwts. to the acre; whilst seventy acres of oats yielded about 1 ton 19cwts. This brings the general hay average up to a little over 1 ton 13cwts. to the acre.

I may now review briefly the different fields.

The Island.

The furthest field of the College Farm was purchased in 1897; was cropped in 1898 with wheat, manured with 2cwts., or thereabouts, of superphosphate, and yielded 21bush. per acre. In 1900 it was fallowed, and in 1901 was under crop with wheat (144 acres) and oats (thirty acres).

A strip of oats was sown alongside the road to take off the influence of trees that might interfere with the yield of the variety of wheat nearest them. Fifteen varieties of wheat were sown, as follows:—

No.	Variety.	Date of Sowing.	How Pickled.	Area.	Yield per Acre.
				Acres.	bush. lbs.
1	Defiance	April 24	Hot water	11½	24 41
2	Dart's Imperial	" 25	"	16	21 39
3	Tuscan	" 27	"	18½	21 49
4	Fan	" 29	"	9	27 11
5	Purple Straw	May 1	"	10	26 9
6	Early Purple Straw	" 2	"	7	21 35
7	Warwick	" 3	"	10½	23 0
8	Jerkin	" 7	"	7½	20 56
9	Unnamed	" 16	"	1½	14 30
10	"	" 16	Bluestone	1½	18 6
11	"	" 17	Formalin	1½	21 37
12	Gluyas'	" 16	Hot water	11	19 26
13	Neumann's	" 15	"	14	23 33
14	Smart's Pioneer	" 15	"	2	25 59
15	Californian Purple	" 15	"	8	23 4
16	Bearded (College selection)	" 14	"	8	25 54
17	King's	" 13	"	7	27 44

The manure used was about 200lbs. per acre of superphosphate, 36 per cent. to 38 per cent.

The western corner was sown with oats on the 4th, 6th, and 7th of May over a dressing of manure similar to that applied to the wheat, and was cut for hay.

This was the show field of the place; in it were tested different kinds of wheats one against the other, and Professor Lowrie's old friend, King's Early, again came out first, although Fan was a good second. Had it not been for the rust, there is no doubt but that the verdict would have been somewhat different. Defiance, Dart's Imperial, and Tuscan looked magnificent in the early season—good enough for 40bush.; Defiance, at all events, but they all suffered badly from rust.

All the fifteen varieties sown in this field, excepting Gluyas, were more or less affected by the rust; the latter, however, appeared to be absolutely free from it. Its yield, however, viz., 19bush. 26lbs., is amongst the lowest. The wheats that appeared to have suffered most from rust and that carried the greatest proportion of pinched grain were, in order of demerit:—1. Tuscan; 2. Dart's Imperial; 3. Defiance; 4. Neumann's; 5. Californian Purple.

Jerkin, Warwick, Smart's Pioneer, Unnamed, and Purple Straw might be bracketed together as having suffered little from the effects of the rust, although showing abundant traces of it.

From King's Early, Fan, Early Purple Straw, Bearded Innominate, an excellent sample was obtained, the rust appearing too late to do them any serious damage. Early Purple Straw was particularly good, and the figures given for its yield are hardly fair to it, as, unfortunately, it shows a bad tendency to shake out, and without doubt several bushels were left on the ground.

On the whole the yield of this paddock was excellent, averaging 23bush. 30lbs. from about ninety-six acres, as against 21bush. obtained from it in 1898.

The yield in hay was also heavy, probably over 2 tons to the acre. It is impossible to ascertain exactly how much, as the hay from an adjoining field was stacked with it.

The oaten hay, which was kept separate, amounted to about 79 tons from thirty acres, or about 2 tons 13cwt. to the acre.

Nottle's.

This is the field that brought down our average both in grain and hay. Unfortunately in it were made the manure tests. I am afraid that much importance cannot be attached to this season's results. It is difficult to explain the failure of this paddock. Perhaps several circumstances contribute to it. In the first place, seeding was delayed owing to the unfavorable conditions that prevailed in the early season. As things subsequently turned out it would probably have been better to have sown earlier. Germination was exceedingly unsatisfactory, so that the thick-sown plots were extremely thin. I believe that Professor Lowrie partly blamed pickling with hot water for this mishap. It is possible, too, that the fact that the wheat was cut exposed to a heavy rain in January, 1901, may have contributed to injuring the germinating powers of the grain. In any case millers to whom a sample was submitted reported, without knowing anything of the facts, that the germ had been injured and the wheat evidently exposed to wet weather at one time or other.

The yield of this paddock in wheat was 13bush. 35lbs. I cannot find out what its previous records were, but I understand that they were never very high. It is possible that the fact that this year's crop was the third cereal in four years, might tend to partly explain its comparative failure.

This field was purchased in 1898, and part of it (seventy acres) was cropped with wheat in 1898; the remainder was fallowed in that year. In 1899 the whole field was cropped, the fallow and half the stubble with wheat and the remainder of the field with oats. On part of it, therefore, the 1901 crop was the third cereal crop within four years, and the second crop in the same period on the other part. About three chains all round the field was ploughed in the dry summer weather—January and February, 1900—and the whole was fallowed in the following winter. In September there was not much difference between what was summer ploughed and the remainder, though on the spots where light brashy land prevails the crop looked a little sickly, but recovered. The eastern end of the field was sown with Warwick wheat for hay in the second week of May, with 2cwts. of superphosphate, 36 per cent. to 38 per cent. The middle of the field consisted of experimental plots, in which tests were made relative to (1) methods of sowing broadcast and drilling, (2) quantity of seed per acre, (3) quantity of manure, (4) kinds of manure, as follows:—

I.—BROADCASTED *V.* DRILLED.

A. THIN SEEDING—

1. Manure and seed drilled together—			Yield per Acre.
Manure	168lbs. per acre	}	15bush. 22lbs.
Seed	39lbs. "		
2. Manure and seed broadcasted with the drill and harrowed in—			
Manure	184lbs. per acre	}	18bush. 43lbs.
Seed	36lbs. "		

B. THICK SEEDING—

1. Manure and seed broadcasted with the drill—		
Manure	231lbs. per acre	} 22bush. 34lbs.
Seed	57lbs. "	
2. Manure and seed drilled together—		
Manure	251lbs. per acre	} 23bush. 23lbs.
Seed	68½lbs. "	

The manure used was superphosphate (36 per cent. to 38 per cent.), the wheat King's. The difference in the quantities of seed and manure on these plots, 1 and 2 respectively of each test, arose from the fact that, though the drill was unaltered, it distributed varying quantities, probably from unevenness in the degree of freedom with which the manure ran.

II.—QUANTITY OF MANURE.

		Yield per Acre.
1. No manure	3·3 acres	} 9bush. 41lbs.
Seed	74lbs. per acre; King's	
2. Manure	1cwt. per acre; 3·3 acres	} 16bush. 48lbs
Seed	70lbs. per acre; King's	
3. Manure	1½cwt. per acre; 3·3 acres	} 18bush. 11b.
Seed	60lbs. per acre; King's	
4. Manure	2cwt. per acre; 3·3 acres	} 18bush. 21lbs.
Seed	63lbs. per acre; King's	

The manure used was superphosphate (36 per cent. to 38 per cent.), and the seed was steeped in water at 132° F. for ten minutes. The plots were sown on and between the 23rd and 24th of May.

III.—DIFFERENT KINDS OF MANURES.

No.	Kind of Manure.	Area.	Quantity of Manure.	Quantity of Seed.	Date of Sowing.	Yield per Acre.
		Acres.	Cwts.	Lbs.		Bush. Lbs.
1	Wallaroo Phosphate Company's superphosphate, 36 to 38 per cent.	4·8	2	60½	May 27	16 50
2	Wallaroo Phosphate Company's superphosphate, 40 per cent.	4·8	2	56	" 27	17 21
3	Alkali Company's superphosphate, 35 to 37 per cent. (Wills & Co.)	9·6	2	57½	" 27	13 13
4	Superphosphate, " Sheep " brand (Snow & Co.)	4·75	2	57	" 28	11 56
5	Superphosphate (Adelaide Chemical Works)	2·37	2	57	" 23	14 32
6	Superphosphated guano (Adelaide Chemical Works)	2·37	2	55	" 8	12 56
7	Complete manure (Adelaide Chemical Works)	2·37	2	57	" 28	13 7
8	Superphosphate, Mineral (Adelaide Chemical Works)	2·15	2	61	" 29	12 32
9	Super. B (Adelaide Chemical Works)	2·15	2	56½	" 29	13 12
10	Superphosphate (Mehrtens')	2·5	2	56½	" 29	10 4
11	Bonedust (Mehrtens')	5	2	56½	" 29	5 48
12	Blood manure (Mehrtens')	1·8	2	56	" 30	4 47
13	Blood manure (Mehrtens') + superphosphate (Lawes'); 36 to 38 per cent.	1·43	1 of each	57	" 30	14 1
14	No manure	4·75	—	57	" 20	6 32
15	Dried blood (Conrad's)	½	2	57	" 30	6 34
16	Bonedust (Conrad's)	½	2	57	" 30	6 34
17	Lawes' superphosphate; 36 to 38 per cent.	5	2	57	" 30	11 11

I must refrain from commenting on the manure tests because of the unsatisfactory nature of the results obtained. It might, however, be pointed out that comparatively slow-acting manures such as blood and bonedust remained absolutely inoperative.

The hay yield could not be given, as it was partly stacked with the hay from the "Island."

Field No. 5.—150 Acres.

In this field seventy-five acres were sown with Calcutta oats, manured with 200lbs. of superphosphate between the 17th and 22nd of May, inclusive. The remaining seventy-five acres was sown with wheat (Jerkin), the western side being sown on the 22nd and 23rd of May, and the eastern between June 1st and 4th.

In the way of results this paddock comes midway betwixt the Island and Nottle's. In parts it was badly overgrown with poppies, and this, again, is perhaps attributable to the fact that, although fallowed in 1900, the crop formed the third cereal within four years. The oats in particular were badly treated by the poppies, and part of them (eighteen acres) had to be cut for ensilage. Of what remained, seventeen acres were cut for grain, yielding 28bush. 39lbs., and forty acres for hay, yielding 65 tons, or 1 ton 12½cwt. per acre.

Nor was the wheat crop particularly brilliant; perhaps fairly up to the average for the season. Eighteen (18) acres stripped for grain yielded 19bush. 4lbs. per acre. The fifty-six acres of hay yielded about 71 tons, or about 1 ton 5½cwt. per acre.

It is of course regrettable that Professor Lowrie is not in our midst to report on his own crops. He would have been better able to interpret the results obtained and to drive home the lessons to be derived therefrom. As much as possible I have endeavored to give simply an abstract of the year's harvest without unduly obtruding my own opinion.

FERTILISERS FOR WHEAT CROPS.

BY W. L. SUMMERS, INSPECTOR OF FERTILISERS.

Early last year Mr. F. H. Snow, the South Australian representative for Star brand Thomas phosphate and Sheep brand mineral super., asked me to suggest the names of reliable farmers to carry out experiments with these two brands of fertilisers, and also to suggest a scheme of experiments. Being acquainted with the majority of the members of the Agricultural Bureau throughout the State, I was in a position to suggest the names of men who could be relied upon to give the manures a fair test, and twenty-one names were submitted to Mr. Snow, who agreed to supply manures to each one to carry out the following tests:—

Plot No. 1, to receive 84lbs. Thomas phosphate two months before seeding.

Plot No. 2, to receive 84lbs. Thomas phosphate at seedtime.

Plot No. 3, 84lbs. mineral super.

Plot No. 4, 140lbs. mineral super.

Plot No. 5, 140lbs. Thomas phosphate.

Plot No. 6, no manure.

Each plot to be of one acre in extent.

The objects of the experiments were to test (1) the relative effect of Thomas phosphate and super. in the two different dressings; (2) the relative effect of ½cwt. and 1½cwt. of manure per acre; (3) whether any advantage was gained by placing the Thomas phosphate in the soil some time before seeding. It was made a stipulation that clean fallow was to be used for the experiments, except where, owing to climatic conditions, fallowing was not practised; that a variety of wheat proved suitable to the district should be sown; and that other than the manuring the cultivation of all plots should be exactly alike. Several of those who were asked to undertake the experiments advised that they would not be able to afford the time required to harvest and weigh the plots separately, but manure was supplied to Messrs. A. F. Noll (Quorn), W. Towill (Purnong), T. W. Hiscock (Meningie), W. Lange (Mount Remarkable), D. P. Thomas (Scales Bay), C. E. Birks (Wandearah East), J. W. Schuppan (Wilmington), F. Roediger (Gawler River), J. C. Ruwoldt (Mount Gambier), A. L. McEwin (Brinkworth), L. F. Christie (Morphett Vale), J. Brown (Port Elliot), J. W. Vigar (Rhine Villa), and J. Crawford (Normanville). The manure was delivered free of cost to the recipients by Mr. Snow on behalf of the firms he

represents. Owing to several experimenters reporting that experience had proved that it was unprofitable to sow wheat on unmanured land, and that it would only increase their work without any practical good resulting from sowing one plot without manure, nearly all omitted plot No. 6. For convenience in distributing the manures the order of the plots was altered in several instances. The following are the results of the experiments, compiled from reports received.

In dealing with the financial aspect of the experiments the Adelaide cost of the fertilisers is taken, and 2s. 6d. per bushel allowed for the wheat. This, on the whole, shows the profit somewhat lower than it actually is. The nearer the farmer is to our principal shipping ports the less the freight on manure and the higher the price for wheat. The present price for wheat at Adelaide or Port Adelaide is 2s. 9d. to 2s. 10d. per bushel.

Quorn.

MR. A. F. NOLL.

Soil of a red sandy nature fallowed early and ploughed twice. Had not previously been manured. Sown on April 12 with 60lbs. King's Early wheat per acre; land in good tilth, but very dry. Weather after seeding continued dry, and there was not sufficient rain to bring up the seed properly, nearly half of it malting, and the crop was consequently thin. Mr. Noll thinks that owing to the loose, dry condition of the soil the drill worked the seed in too deeply, and the light rains that fell did not go down far enough. The rainfall from seeding to harvesting on November 29 was 8·88in.

No. of Plot.	Manured with—	Yield.		Weight per Bushel.	Cost of Manure	
		bush.	lbs.		s.	d.
1	84lbs. Thomas phosphate two months before seeding.....	3	0	62½	2	9
2	84lbs. Thomas phosphate with seed	3	15	62½	2	9
3	84lbs. super.....	6	23	63	3	4
4	140lbs. super.	8	29	63	5	8
5	140lbs. Thomas phosphate	6	47	63½	4	7

Mr. Noll reports that plots 1 and 2 were about the worst crops on the farm. The balance of the paddock in which these experiments were conducted was manured with 80lbs. mineral super. and averaged 8bush., some going as high as 10bush. All the wheat from the manured land was a prime sample, while the unmanured crops were inferior.

The advantage derived from the use of the manure seemed mainly that the crops were more forward and the grain was full before the hot winds set in. Some of the unmanured crops made more straw, but, being later, they did not mature properly, and both yield and sample suffered.

In comparing the yields from these plots it will be seen that the light dressings of Thomas phosphate had practically no result. An extra ¼cwt. of this manure increased the yield to the extent of 3½bush., but it will be seen that 84lbs. of super., costing 1s. 3d. less, gave within 24lbs. of the yield of plot 5. The heavier dressing of super. proved distinctly profitable. Compared with plot 3, an extra outlay of 2s. 4d. returned 2bush. 6lbs., while in comparison with No. 5 1bush. 42lbs. extra is a set off against the additional outlay of 1s. 1d. There is little doubt that the manured crops would have yielded better had it not been for so much of the seed malting, owing to being sown too deep.

Wilmington.

MR. J. W. SCHUPPAN.

Early fallow land, a sandy loam, was used for the experiments. Land had not been previously manured. Forty-five pounds per acre Purple Straw wheat was sown on May 29, and wheat was harvested on December 6. When sown the land was rather dry, but with constant working a good tilth had been secured. June was a very dry month, only 90 points of rain being recorded. The rainfall from seeding to harvest was 9.66in. The early part of the season proved very disappointing, but with favorable weather in August and September the crops made splendid growth, and up to middle of November they looked very promising. Towards the close of the month rust appeared and made rapid progress. Mr. Schuppan is of opinion that the yields from the plots were reduced fully one-third through rust.

Results of Experiments.

No. of Plot.	Manured with —	Yield of Marketable Wheat per Acre.	Cost of Manure per Acre.
		bush. lbs.	s. d.
1	75lbs. Thomas phosphate two months before seeding	10 2	2 6
2	60lbs. Thomas phosphate at seeding	11 17	2 0
3	60lbs. mineral super.	15 5	2 5
4	100lbs. mineral super.	15 36	4 0
5	135lbs. Thomas phosphate	13 3	4 5

Owing to Mr. Schuppan not being expert in the use of the fertiliser drill the quantity of manure recommended for each plot was not strictly adhered to, but a comparison is readily made. These results plainly show that Thomas phosphate is not sufficiently quick in its action to be profitable on these dry Northern soils. Taking the lowest result as a basis for comparison, it will be noted that putting the Thomas phosphate into the soil beforehand is not advisable. A lesser dressing by 15lbs. applied with the seed yielded 1bush. 15lbs. more per acre than where the manure was applied two months prior to seeding. The heavy dressing of Thomas phosphate increased the yield by 1bush. 46lbs. at an extra cost of 2s. 5d., showing a small profit for the extra quantity used. Sixty pounds mineral super. gave 2bush. 2lbs. more than 135lbs. Thomas phosphate and cost 2s. less. Increasing the quantity of super. resulted in a loss. For one-seventh extra in manure only 31lbs. of wheat was obtained.

These lands are naturally rich, and with good cultivation it appears doubtful whether the heavier dressing will return sufficient profit to warrant the risks involved, as the small rainfall militates against the full benefits being obtained from the manure.

Mr. Schuppan states that he is convinced that it will pay well to apply from 60lbs. to 100lbs. of super. per acre, and that under his conditions it would be foolish to put in the crop without it. The difference between the manured plots and crops put in without was very marked. It is unfortunate that the results should have been so much interfered with by red rust, which spread very rapidly in the crops during the latter part of November. When an official visit of inspection was paid by the members of the Wilmington Agricultural Bureau, in November, the plots looked exceedingly promising, and were estimated to yield from 14bush. to 20bush. per acre, the most likely plot being No. 4, with 100lbs. super. per acre. The actual results were, in nearly every instance, about one-third less than the estimates made before the appearance of rust in the crops.

Mount Remarkable.**MR. W. LANGE.**

Land a good red loam, fallowed early, and never manured previously. Sown on May 2 with 50lbs. Dart's Imperial wheat per acre, land being in good tilth, but very dry. The rainfall from sowing to reaping was about 15in., but the early part of the season was too dry, while late rain resulted in the development of red rust.

Results of Experiments.

Plot.	Manured with—	Yield.	Increase over Plot 1.	Cost of Manure.	Profit over Plot 1.
		bush. lbs.	bush. lbs.	s. d.	s. d.
1	84lbs. Thomas phosphate, two months before seeding	9 31	—	2 9	—
2	84lbs. Thomas phosphate, with seed	13 12	3 41	2 9	9 2
3	84lbs. super.	16 24	6 53	3 4	10 6
4	140lbs. super.	16 5	6 34	5 8	13 6
5	140lb. Thomas phosphate	13 45	4 14	4 7	8 9

Owing to the ravages of rust the unmanured crop had to be cut for hay, so no comparison of returns from manured and unmanured land can be made. In plot No. 1, however, the application of Thomas phosphate does not appear to have given any increase, as the same quantity applied with the seed increased the yield by nearly 40 per cent. The most profitable return comes from the use of 84lbs. mineral super. per acre; increasing the amount to 140lbs. lowers the profit by 3s. per acre. Thomas phosphate is not profitable in comparison with super. The heavier dressing of this manure is also less profitable than a light one. The greater profit from the lighter dressings of manure is probably due to the fact that the soil is naturally rich and the rainfall is not sufficient to enable the whole benefit of the manure to be secured the first year. Mr. Lange is satisfied with the benefits derived from the use of mineral super., which he considers well suited to his land.

Brinkworth.**MR. A. L. McEWIN.**

Soil is light alluvial of limestone formation, was fallowed in July of previous year, and had not previously been manured; 45lbs. of purple straw wheat was sown on May 1; reaping was done on December 5. The ground was very dry, but had been worked to a good tilth. Season opened dry, the seed lying in ground for nearly a month before sufficient rain fell to cause it to germinate. The total rainfall from seed time to harvest was just 8in. Up till September 18 the plant had suffered severely from want of moisture. Good rain following considerably improved the prospects of the crop. Rust lessened the yield somewhat.

No of Plot.	Manured with—	Cost of Manure	Result.
		s. d.	bush. lbs.
1	84lbs. super. on March 16	3 4	11 56
2	84lbs. Thomas phosphate on March 16	2 9	6 29
3	84lbs. Thomas phosphate with seed	2 9	6 15
4	140lbs. Thomas phosphate with seed	4 7	6 31
5	140lbs. super. with seed	5 8	13 11

On this soil Thomas phosphate appears to give no results. There is practically no difference between the return from the three plots treated with this manure. The dry season was undoubtedly largely responsible for this, but as we have so frequently to contend with such adverse conditions the lessons are instructive. On the other hand it will be seen that the super. plots gave an appreciable increase, notwithstanding the small rainfall. Taking No. 3 plot as a basis for comparison, No. 1 plot returned 5bush. 41lbs., and No. 5, 6bush. 57lbs. more at a cost of 3s. 4d. and 5s. 8d. respectively. Mr. McEwin states that had plot No. 1 not been affected by the proximity of a row of pines it would have yielded equally as well as No. 5. Plot No. 1 was manured six weeks before the seed was sown, and the results show that on clean well-worked fallow land little if anything is lost by putting the super. in beforehand, while much may be gained thereby. A farmer does not need to be told of the difference in the strength required to drill in the manure while the land is dry and easily worked as compared with drilling in after rain. In a paper read at the Annual Bureau Congress in 1900 Mr. R. Marshall referred to his experience in this connection as follows:—"I am fully convinced, from my own practice, that equally good results can be obtained by applying superphosphate to the soil at any time between harvest and seed time, either with the seed drill or any other means of covering it at a reasonable depth. The manure is thus placed in the soil when the land works light; seeding is greatly facilitated by allowing the extra horse strength that would be required for working the drills to be used on other necessary implements for getting in the seed with the use of the broadcast seed sower. Any advantages gained by the use of the drill in placing the seed and manure together (if any) are more than compensated by the saving of time and labor under the broadcast system." It must of course be borne in mind that these remarks applied to clean well-worked fallow, and to the application of 1cwt. per acre or more of manure.

Rhine Villa.

MR. J. W. VIGAR.

Soil a stiff red loam, fallowed in July after being spelled for ten years and grazed with sheep. The soil was in good heart, and at seed time (April 27 to 29) was very loose and dry. There was not sufficient moisture to bring up the crop until beginning of June. Over 4in. fell in June and July, and the crop started well. The spring was, however, very dry, and hot winds in October did a lot of harm. The rain recorded from seeding to harvesting on December 20 was 8.49in.

No. of Plot.	Manured with—	Yield.		Cost of Manure.	Profit from Manure.
		bush.	lbs.	s. d.	s. d.
1	84lbs. Thomas phosphate two months before seeding ..	12	27	2 9	—
2	84lbs. Thomas phosphate with seed	15	5	2 9	6 7
3	84lbs. super.	13	20	3 4	1 8
4	140lbs. Thomas phosphate	16	23	4 7	8 0
5	140lbs. super.	13	24	5 8	loss, 6d.
6	No manure	11	20	—	—

The plots manured with super produced a very rank growth and were much blighted by hot winds. Plot No. 1 made no better growth than the unmanured plot, but gave a slightly better return, though this barely paid for the manure. The land being in very good heart, as the return from the unmanured plot demonstrates, did not apparently require much manure, though plots No. 2 and No. 4 show a decided profit on the cost of the manure. The super. evidently

caused too much growth on the land already in good heart, and, being caught by the early hot winds, suffered severely; with a better fall of rain it is probable that it would have yielded much better. The profit on plot No. 3 was only 1s. 8d. per acre, and on plot 5, with heavier dressing, there was an actual loss. Under average conditions the super. would have undoubtedly shown more profit, as a return of over 11bush. from the plot not manured is high for this locality.

Purnong (east of River Murray).

MR. W. TOWILL.

Soil is a sandy loam with patches of marl, was fallowed early, and had never been manured previously. The land was friable, but very dry when sown on May 15. No rain fell till June 5 sufficient to bring up the wheat. A fair amount of rain was recorded during June and July, but August (0.55in.) and September (0.58in.) were very dry, and hot winds were troublesome. The record from seed time to harvesting was less than 7in. of rain. Dart's Imperial wheat was used in the tests, $\frac{1}{2}$ bush. per acre being sown except on plot No. 1, on which 45lbs. per acre was broadcasted.

Result of Experiments.

No. of Plot.	Manured with—	Yield per Acre.		Cost of Manure per Acre.		Profit.	
		bush.	lbs.	s.	d.	s.	d.
1	84lbs. Thomas phosphate drilled in in March	8	6	2	9	2	6
2	84lbs. Thomas phosphate put in with seed	8	38	2	9	3	10
3	140lbs. Thomas phosphate	9	58	4	7	5	4
4	84lbs. super.	11	1	3	4	8	2
5	140lbs. super.	15	9	5	8	17	2
6	50lbs. super.	11	15	2	1	13	6

Unmanured land averaged only about 6bush. Plot No. 6 was on ground hardly so dry as No. 4; hence it did not suffer quite so much during the hot dry weather, and if it had been more heavily manured Mr. Towill is of opinion that it would have yielded much better. Plots Nos. 4 and 5 were a good deal more forward than the others in September, when it set in very hot and dry and were a good deal blighted by hot winds. Mr. Towill states that the contrast between these plots and the unmanured crops was very marked, the latter in many instances in this district being almost total failures. He is also confident that on the light sandy soils, which hold the moisture fairly well, it will pay to use up to 2cwts. per acre. Owing to the extreme dryness of the early part of the season, the total rainfall for the first five months of the year being only 1.33in., no benefit whatever resulted from the early application of Thomas phosphate; in fact, where the seed was put in contact with the manure the yield was $\frac{1}{2}$ bush. per acre better.

In making a comparison of these results it will be noticed that, dealing with plots 2 and 3, 1s. 10d. extra value in manure produced 1bush. 20lbs. extra of wheat. Superphosphate, as might be expected with the low rainfall, has yielded much more profitable results. On plot 4, at a cost of 1s. 3d. less, the yield is 1bush. 3lbs. more than on plot 3, notwithstanding that plot 4, being more forward, suffered more from early hot north winds. Plot 5 compares very favorably with both 3 and 4. Comparing it with No. 3, the same quantity of super. on plot 5 (costing, however, 1s. 1d. per acre more than the Thomas phosphate) gave an extra return of 5bush. 11lbs. As compared with No. 4, it showed an increase of 4bush. 8lbs per acre, at a cost of 2s. 4d. Plot 6 cannot be taken into comparison because, as stated before, it was somewhat better situated as regards the moisture in the soil.

Mr. Towill informs me that he drilled in his crop for hay with 50lbs. mineral super. per acre, leaving a strip through the field without any manure. This strip yielded at the rate of about 6cwts. per acre as compared with 20cwts. per acre from the manured land. It is very evident that on the light sandy lands east of the Murray manuring with super. will pay; in fact, is almost a necessity.

Scale's Bay (West Coast).

MR. D. P. THOMAS.

Scrub land, of sandy nature, very loose and in good tilth. Fallowed in August, 1900. The land had not been previously manured. Three-quarters of a bushel of Steinwedel wheat per acre was sown on April 16, the weather being dry for some time afterwards. The plots were harvested on December 4, the rainfall from sowing to reaping being between 9in. and 10in.

Results of Experiments.

No. of Plot.	Manured with—	Yield.	Weight per Bushel.	Cost of Manure per Acre.
		bush. lbs.		s. d.
1	84lbs. Thomas phosphate, prior to seeding	2 4	Very poor and shrivelled grain	2 9
2	84lbs. Thomas phosphate, at seeding ..	2 1	56lbs. per bush., very poor	2 9
3	84lbs. mineral super.	3 16	57lbs. per bush.	3 4
4	140lbs. mineral super.	4 12	59½lbs. per bush	5 8
5	140lbs. Thomas phosphate	2 43	57½lbs. per bush.	4 7
6	No manure	1 13	56lbs. per bush.	—

Owing to the ravages of red rust the result is not a fair test. Up to the end of October the plots looked promising, but heavy rains followed by steamy weather caused rapid development of rust, the grain in all the plots being seriously affected. The growth of straw was very promising, and until rust came Mr. Thomas fully expected to reap from 12bush. to 16bush. per acre from plot 4, which was the best of the lot. From the start the plots manured with super. showed to advantage, but no improvement in the crops manured with Thomas phosphate was noticeable until late in the season. The contrast between the manured and unmanured plots was very marked, and Mr. Thomas is satisfied that superphosphate will prove valuable for wheat crops in this locality. While but little can be learned from this series of experiments, it proves that under unfavorable conditions and with light rainfall super. will give good results on the sandy lands of the West Coast. In view of the large area of this class of country, further experiments are desirable.

(To be continued.)

DURABLE WHITEWASH.—Slake ½bush. of lime with boiling water, cover during process to keep in steam, strain the liquid through a fine sieve, add a peck of salt, previously dissolved in warm water; 3lbs. of ground rice boiled to a thin paste, and stirred in while hot; ½lb. of Spanish whiting and 1lb. of glue, previously dissolved by soaking in cold water, and then hanging over in a small pot hung in a larger one filled with water. Add 5galls. of hot water to the mixture. stir well and let stand a few days covered from dirt. It should be applied hot, for which purpose it can be kept in a portable furnace. A pint of this mixture, if properly applied, will cover a square yard, and will be almost as serviceable as paint for wood, brick, or stone, and is much cheaper than the cheapest paint.

ANALYSES OF FERTILISERS.

BY W. L. SUMMERS, INSPECTOR OF FERTILISERS.

The following table shows results of analyses of samples of fertilisers obtained by myself during the past few weeks. Where more than one sample of any brand has been analysed, each analysis is shown separately:—

Vendor.	Brand.	Water Soluble Phosphate.		Acid Soluble Phosphate.		Nitrogen.	
		Guarantee.	Official Analysis.	Guarantee.	Official Analysis.	Guarantee.	Official Analysis.
		per cent.	per cent.	per cent.	per cent.	per cent.	per cent.
Geo. Wills & Co.	United Alkali Co. Super.	36.0	38.0, 37.6	—	—	—	—
Do.	do.	37.0	39.0	—	—	—	—
Clutterbuck Bros.	do.	37.0	39.0	—	—	—	—
Do.	do.	36.0	38.0, 37.6	—	—	—	—
Do.	Packard's Super.	36.0	40.0	—	—	—	—
Elder, Smith, & Co.	Lawes Super.	36.0	39.2, 39.8	—	—	—	—
S.A. Farmers' Co-operative Union	Ohlendorff's Super.	36.0	39.9	—	—	—	—
Do.	United Alkali Co. Super.	36.0	37.6	—	—	—	—
Do.	do.	37.0	39.0	—	—	—	—
Australasian Implement Co.	Ohlendorff's Super.	36.0	37.3	—	—	—	—
Do.	Wallaroo Super.	36.0	40.6	—	—	—	—
Wallaroo Phosphate Co.	Cross & Co.'s Super.	36.0	37.7, 37.5	—	—	—	—
Norman & Co.	Mineral Super.	36.0	37.8	—	—	—	—
Adelaide Chemical Works Co.	Bally Bonedust	36.0	47.1	—	—	—	—
Do.	Bonedust	—	—	52.0	54.8	3.5	3.74
Do.	Farmers' Fertiliser	—	—	45.0	46.0	4.0	3.2
Excelsior Manure Co.	Bonedust	—	—	30.0	39.1	2.0	3.37
Crompton & Son.	Bonedust	—	—	44.5	44.7	3.9	4.24
Mehrteus & Co.	Bonedust	—	—	43.77	45.6	4.23	3.8
Geo. Wills & Co.	H. & E. Alberts' Thomas Phosphate	—	—	35.0	39.7	—	—
Elder, Smith, & Co.	Bilston Thomas Phosphate	—	—	39.5	44.7	—	—

CONCENTRATED SUPERPHOSPHATE.

BY W. L. SUMMERS, INSPECTOR OF FERTILISERS.

The ordinary grade mineral super. used in this State is guaranteed to contain 36 per cent. of water-soluble phosphate, and is sold at £4 7s. 6d. to £4 10s. per ton, on trucks at Port Adelaide. The rail freight on the manure, in many instances, brings the cost to the farmers up to £5 per ton. The question naturally arises whether this heavy expense proportionate to first cost cannot be reduced, and I have received inquiries from farmers concerning higher grade supers. A high grade concentrated super., containing 92 per cent. of water-soluble phosphate and 6 per cent. citrate-soluble phosphate, is imported for manufacturing purposes mainly, and it is probable that where freights are high it will pay farmers to use this in place of the ordinary super. On inquiry from Messrs. Geo. Wills, & Co., the importers, I find that the concentrated super. can be sold here at £11 10s. per ton. One ton of this will contain as much plant food as 2½ tons of ordinary mineral super. Where the cost of rail or other freight comes to 10s. per ton, the saving by using concentrated super. is shown as under :—

2½ tons 36 per cent. super. at £4 10s.	£11 10 0
Freight on 2½ tons, at 10s.	1 5 6
	<hr/> £12 15 6
1 ton concentrated super.	£11 10 0
Freight on 1 ton	0 10 0
	<hr/> £12 0 0

These figures show a total saving of 15s. 6d., equivalent to 6s. per ton. Where a farmer uses 20 tons ordinary super., the substitution of concentrated super. would reduce his account from £100 to just under £94, an amount of considerable importance. Of course, where freight charges amount to more than 10s. per ton the saving would be greater. As an instance, Mr. W. Towill, of Purnong, writes me that the rail charges to Murray Bridge from Port Adelaide came to 5s. per ton, and water carriage to Purnong to 7s. 6d., a total of 12s. 6d. Here the substitution of 1 ton of concentrated super. for 2½ tons ordinary would save 19s. 6d. Where freight is only 7s. 6d. per ton the saving would be 11s. 8d.

In dealing with this matter, however, there is one important point to bear in mind, and that is the distribution of concentrated super. The farmer who will not put on more than 56lbs. to 72lbs. per acre of ordinary super. would find it a very difficult matter to secure the even distribution of the equivalent quantity, *i.e.*, 22lbs. to 29lbs. per acre of concentrated super. Of course he might mix it with dry ashes, sand, or gypsum to increase the bulk, but few farmers have the appliances at hand with which they could do this so as to distribute the super. evenly through the mass. On the other hand, the equivalent of 1cwt. per acre of ordinary super, *i.e.*, 44lbs. concentrated, could be applied without difficulty.

I have ascertained from Messrs. Geo. Wills & Co. that, in order to enable farmers to test this matter for themselves, they are prepared to supply 2cwt. bags of concentrated super., on trucks at Port Adelaide, for 23s. cash, the same rate at which they quote per ton. Farmers who are so situated that freight costs over 7s. 6d. per ton will do well to avail themselves of this offer.

FARM HINTS FOR FEBRUARY.

BY THE EDITOR.

There are a few active farmers who think it worthy of the risk to sow a little rape and white mustard seed on some stubble land, and to harrow it in so as to secure an early green bite for the live stock. On such a piece of paddock the seeds of weeds, rape, and mustard will germinate with the first early rains, and by the time the natural herbage comes up the other feed is about knee high sometimes. Later on, and before any of the plants have produced seeds, the field may be properly ploughed, and will be clean and fit for the growth of a cereal crop.

The experience of season 1901-2 with regard to red rust ought to last some of our farmers for a lifetime. There are several varieties of wheat that are very resistant to red rust, and they are reasonably prolific and of good milling quality. Why not ascertain which of those varieties are best suited to the conditions of each particular district, and sow the greater portion of the fields with the reliable sorts?

Continuous cropping with one variety or kind of plant reduces the capacity of the land for its production. It may be worth while to grow something different next year where a cereal was produced last season, and it might pay in some places to plough under a green crop to change the nature of the soil.

No crop can do well if the soil is caked on the surface, because the moisture that rises from below is at once evaporated. To maintain a moist condition of the subsoil, to prevent a too rapid escape, and to promote absorption of water from the atmosphere at night—if not by day—the surface must be kept in a loose pulverised condition all the time the crop is growing, especially during summer and autumn. Beets, mangolds, kail, sorghum, &c., must be cultivated all the time they are growing, not only to destroy weeds, but also to maintain a loose condition of the upper 2in. or 3in. of soil.

Lucern will grow in deep sandy loam to the best advantage; but it is so useful and valuable a crop that nearly every farmer should try experiments with it. Plough some land deeply, and break it thoroughly from top to bottom; make it as level as possible, and as fine on top as if meant for an onion bed. Drill in 8lbs. or 10lbs. of seed about 1in. deep, in rows 1ft. apart, and then roll the land. In localities subject to early frosts at night it may be better to sow during October, but in many localities February and March sowings may do better. The important point to remember is that the young plant is very susceptible to injury from night frosts, but when it has gained strength and sent its roots well down into the soil it will withstand a good deal of frost. The object, then, is to get the plants well established before the cold weather approaches.

"Blot," "blast," "blown," "hoven," and other strange names are used to denote the disease of animals that is caused by the excessive generation of gas in the stomach through eating too hastily of certain kinds of food. Clover, sorghum, raw wheat, and many other wholesome articles of stock feed have caused the deaths of thousands of valuable animals. To prevent "tympanitis"—for that is the best name for the disease—care should be taken that the animals do not get at such foods when they are ravenously hungry, and to gradually introduce such foods to them. If any cow or horse should become "blown," give it at once a heaped tablespoonful of carbonate of soda, dissolved in 1½ pts. of water. Smaller animals require smaller doses.

There are many situations where small streams or "springs" flow down gullies on farms, and if the water were made to flow along channels with a much lesser gradient it could be siphoned or otherwise conducted on to cultivable

plots, where wonderfully prolific crops could be raised. On such spots maize could now be sown, and would give heavy cuts of fodder for the cows, or potatoes could be planted, with a certainty of good yields. All kinds of vegetables for the farmer's own table, or even for sale to less fortunately situated farmers, could be raised. With hot weather, a little manure, and enough water the farmer could make his home comfortable and attractive under such circumstances.

In the South-East and cool hilly districts begin to sow seeds of grass, clovers, and other pasture plants. Much is being published about the Golden Crown grass (*Paspalum dilatatum*). Without any doubt whatever it is a good grass on rich, deep loamy soils, where there is a good rainfall and fairly cool climate—not otherwise. It does not grow readily from seed, and therefore some writers recommend that the grass should be grown in nursery beds and then be transplanted. This is a most costly work, and as clovers, trefoils, lucern, perennial rye grass, and several other plants give equally good, if not better, pasturage, it would not be worth while to incur the cost of planting *Paspalum* until more is known about it.

Potatoes can be planted with the aid of the plough if the soil is well broken in turning it over. Each third furrow gives about the proper space between the rows, and the setts should be 1ft. apart and 4in. deep. Not more than two eyes should be on each sett, because where there are many stalks to a plant the potatoes will be small. After planting, it may be worth while to roll and then lightly to harrow the land. Do not ridge up, but use the horse hoe to keep the surface loose and aerated. Where the land can be irrigated there will be still greater necessity for the frequent use of the horse hoe or similar implement.

MARRAM GRASS AT PORT FAIRY, VICTORIA.

REPORT BY A. MOLINEUX.

At Port Fairy, Victoria, and along the coast in places the sand hummocks became denuded of shrubs, grasses, and other vegetation through the grazing and browsing by sheep and cattle, and the sand began to drift over the adjacent rich and valuable soil at a most alarming rate, even to the extent of overwhelming the houses and gardens. Land in the cities and suburbs of Warrambool, Port Fairy, and elsewhere along the coast was far too valuable to be calmly relinquished, and strenuous exertions were made to stem the advancing tide of destruction, but with no success until the Port Fairy Municipal Council consulted the late Baron Ferd von Mueller, who suggested that marram grass might prove effective, and provided some seeds for experimental sowing in the year 1883. The results were astonishing, even to the Baron himself, and now, after eighteen years of planting (for it has been found cheaper, quicker, and easier to propagate from plants than from seeds), where there were miles upon miles of absolutely bare sand hummocks slowly overwhelming land and houses of inestimable value, there are now many miles in length of waving grass 2ft. to 4ft. high, capable of maintaining one cow per acre throughout the whole year, or five or six head for four months during the winter when forage is somewhat deficient on the richer adjacent lands.

Marram grass, for the purpose of arresting drifting sands, stands far ahead of all other plants. It cannot be destroyed by fire, as has been demonstrated sometimes when a fire has occurred on the Port Fairy plantations, but springs again stronger than before. Mowing and feeding off by stock only increases its vigor and vitality, making the grass grow more thickly and of a much finer texture and better quality; and digging out for replanting seems to improve the density and fineness of growth more than anything else. The small roots left in the sand send up fresh shoots, and the locality soon puts on the appearance of a field of rye upon which too much seed has been sown.

Marram grass possesses another extraordinary property, in that opposition and persecution only make it more active and vigorous in growth. Where the sand drifts the most—after the plant has taken hold by its roots—there the grass grows the most vigorously. As the sand accumulates over the grass fresh growths come up, even though the final elevation may reach 100ft. above the original level; but wherever the angle of elevation on the windward face of the hill exceeds 45° the sand does not rise with the wind, and it would therefore be wise to secure such a condition by planting the face of the rise with grass. It was very remarkable, in the Port Fairy plantations, to note the very slow growth of the marram grass where the sand could not drift owing to the protection afforded against the prevailing winds by adjacent sandhills.

The accompanying picture shows the bare sand hummocks being planted with marram grass. The faint dark marks in advance of the planters were made by the ranger with his feet, as an indication of where the lines are to be planted. The prevailing strong winds come from the south-west, and the rows run almost directly across their course.



PLATE 1.—SANDHILL BEING PLANTED WITH MARRAM GRASS.

Mr. S. Avery, the park ranger, who has full charge of the plantations, informed us that he always commences planting at the point most distant from the source whence the sand comes, thus making a barrier to its further progress, and at the same time securing the certainty of most rapid growth of the grass on the rest of the drift from the seaward. He always plants across the course of the prevailing winds, though not necessarily in long straight lines, because the contour, elevation, and direction of the faces of the hills cause variations in the force and direction of those winds. He usually plants a strip of six rows at 6ft. apart, with 2ft. between the plants on the brow of the hill most distant from the source of the drift; another six rows at 60yds. to 80yds. nearer the incoming drift; and a third or fourth six rows at any distance according to circumstances and requirements. As the plants become established the intervening spaces become filled by fresh plantations, and as the plants mature they produce great quantities of seed, some of which germinates, and finally the whole area is covered with a dense growth. Great care is taken to plant alternately in rows, so as to have a wall of grass opposed to the drifting sand.

Mr. Avery never cuts off any of the top of the grass before planting, as he is convinced that the long grass on the surface arrests the sand, thus stimulating

growth, and any rain that falls is caught in the leaves and conveyed to the roots below. Where the sand is very loose the grass should be planted 12in. to 15in. deep; but where it is rather firmer 9in. is deep enough. One man digs the holes and another plants the grass, spreading the roots and treading the sand in firmly. It is not advisable to loosen the adjacent sand any more than can be avoided. A "plant" consists of as much grass with roots as can be grasped in one hand, and it requires 3,630 plants for one acre. About 2,800 plants weigh one ton, so that 26cwts. of grass would be needed to plant one acre. In places where loads of marram grass had been laid on the ground and untied the bands have started to grow, and dense masses of grass now stand on the spots.

The Port Fairy Municipal Council has now a deal more of the grass than is needed for extension of its plantations, and, as is usual with all municipal bodies, has always a number of men awaiting employment. For this reason the council is pleased to find work for the unemployed in digging the grass for sale at cost price, or thereabout, to any applicants from other States. They can dig, tie, carry, and place the grass on the railway trucks at Port Fairy for 30s. per ton.

The cost of digging the grass is 12s. per ton, and an acre of grass three years old will supply 10 tons. To dig and replant the grass on adjacent sand hummocks costs £2 10s. per acre. When the grass is well established cattle may safely be put to graze upon it. Summer is the best time for grazing marram; but for three or four months in winter four or five cows can be grazed on an acre; the average, however, is one beast per acre all the year round. Cows maintain their condition and milk on marram grass, we were told, but there was some splendid clover and grass pasturage on the adjacent commonage when we were on our visit. This is probably deficient during winter.

Rabbits are troublesome in some parts of the plantation, and destroy the grass by burrowing beneath and eating the roots. Men are constantly engaged in trapping them, as they will not take poisoned baits whilst there is such abundance of green herbage present.



Plate 2 shows a piece of the plantation that has been in existence only three years, and is not chosen on account of its luxuriance, since there are 200 or 300 acres quite equal to it. Three years ago this spot was absolutely a bare shifting sandhill, as shown in Plate 1; but it would now require a hurricane of terrific power to shift one grain of sand from its well-covered retreat.

Port Fairy Municipal Council controls nine miles of sandhills, and during the past eighteen years has planted 600 acres with marram grass. The council has received £1,000 from the Government, and has probably expended an equal amount from the rates and income to achieve the present result. The work has been done by day labor at 6s. per day, and it is possible that much more could have been done if the work had been let by contract. Still, under the enlightened and skilful superintendence of Ranger S. Avery, very much better results have been secured at Port Fairy than have been obtained at other places that could be mentioned where much larger sums have been expended.

Port Fairy Municipal Council has supplied very large quantities of marram grass plants to most of the Australasian States, as well as to New Zealand, Tasmania, Africa, the south of Asia, and elsewhere. The first marram grass planted in South Australia was procured by myself from Mr. Turner, of the New South Wales Department of Agriculture, and was sent to Corny Point lighthouse, where the sand drift was serious. This, together with some creeping spinifex from the same source, was so successful that the Marine Board has since procured considerable quantities for arresting sand drifts in other localities. Mr. A. Macfarlane, of Wellington Lodge, at junction of Murray River with Lake Alexandrina, has over 400 acres planted with marram; Mr. G. H. McMillan, at Normanville, has a considerable area; Messrs. Bowman, on Lake Coorong, have a lot; and a considerable area has long been planted on Mr. Thomas's estate, on the Finniss, not far from Goolwa. Mr. Charles Tucker, M.P., has 450 acres planted on the sand hummocks, near Murray Mouth, where the drift is very menacing, and he is preparing to plant several thousands of acres on the same hummocks.

Amongst other uses for marram grass can be mentioned thatching, litter for stables, and rough plaiting material, as well as weaving, &c., for coarse baskets.

As illustrative of the extreme vitality of marram grass it may be mentioned that when the first consignment was sent to Newcastle, N.S.W., some delay occurred in its transmission and delivery. The town clerk of that municipality telegraphed "Grass arrived; totally useless; nothing but straw." The reply from Port Fairy town clerk was, "Plant out straw as directed." The engineer, M. Zerwonki, who had charge of reclamation on sand drifts, did as directed, and everybody was astonished at the wonderful growth of the supposed dry straw. Marram grass has been known to start growth after it has been out of the ground for three months; but it would be wise to plant it as soon as convenient after it is dug up.

An important item was observed whilst we were inspecting the marram grass. On a flat piece of pure drift sea sand was a patch of a few rods of dense-growing buffalo grass, which had been planted experimentally by Mr. Avery. This patch was sheltered slightly by the sandhills around, and completely carpeted the sand with a growth 6in. or 8in. thick. This proves that buffalo grass can be grown as a variant on the forage usually grown on drift sands. Another important plant noted was the African boxthorn (*Lycium afrum*), which reached a height of 10ft. It is largely used as a sheltering hedge, and is browsed upon to some extent by stock. We did not observe an equally useful and hardy plant, the tamarisk (*Tamarix gallica*), which grows anywhere and serves as a favorite browsing plant for cattle.

"BLUFF."—The quiet, innocent cultivator of the soil requires now-a-days to beware of the wiles of the cunning man who wants to sell him something for a mere song that will make his fortune. But he must not accept for gospel every or any statement that may be commendatory of the said articles. Codlin moth exterminators, red rust preventives, fire and frost proof fodder plants, and four-fold crop-producing fertilisers, and a host of other attractive baits should be carefully avoided.

DRYING AND PRESERVING GRAPES.

DRYING CURRANTS.—Pick when fully ripe and spread the bunches in the sun for two or three days, when they can be gathered up into a heap and the larger stalks raked out, or be made perfectly clean by passing them through the winnowing machine. The fruit should then be sweated for a fortnight before being tightly packed in boxes to keep for use. Sweating is a process which all dried fruit has to go through. It is merely leaving it in bulk or good sized boxes until the fruit that is too dry has absorbed the surplus moisture from that which is not quite dry enough, and the whole lot becomes equalised.

DRYING RAISINS.—The grapes should be fully ripe when picked, just before they turn to raisins on the vine is the best time, provided it is not much after the middle of March; later in the season than that there is usually some trouble to get them to dry. The Muscatel Gordo Blanco is the proper table raisin grape, but almost any fleshy grape will make a raisin sufficiently good for home use. The grapes, when cut, may be at once spread out in the sun, and when nearly dry on the upper side turned over to complete the drying. With good weather it will take about three weeks, and if damp weather comes on the fruit will want turning occasionally to keep it from remaining damp on the under side. The best table raisins are made in this way, great care being taken to preserve the natural bloom on the berries. The ordinary cooking raisins are made by dipping the grapes for a few seconds in a boiling lye of soda or potash, sufficient to open the pores of the skin, but not to crack the berries right open. When sufficiently scalded the grapes then quickly turn brown in the sun, and they will dry in about a week or less if it is hot weather. They, in common with nearly all other fruit, will be sufficiently dry when you are unable to squeeze any liquid juice out of them. It is a great mistake to over dry fruit, it should be taken up whilst quite soft and pliable. When dry enough it will be found that the stalks will become quite brittle in the afternoon, when the day is beginning to cool down, and a rub over with the hand will break them all up small. This is more easily done over a $\frac{1}{2}$ in. sieve, which will also let some of the small rubbish through. After being stalked they should at once, before the stalks again become limp, be put through the winnowing machine to clean them; they are then to be sweated and packed tightly in boxes. If they are pressed tightly into boxes by lever or screw press the insects cannot play up with them as they are apt to do if put away loose.

GREEN GRAPE JELLY.—When just about to turn color, stem the grapes and let half a bushel heat slowly in a large preserving kettle; stir occasionally to prevent burning; it may be necessary to add a little water. After the grapes come to a boil let them simmer for half an hour, and stir and mash them with a wooden spoon; let the hot juice drip through a cheese-cloth bag, and after washing the kettle used for first boiling, pour the juice back into it. Take equal quantities of cane sugar and grapes, and after heating the sugar without burning, add it to the juice; let it boil twenty minutes, stirring to prevent burning, and fill the glasses or bowls while hot. After a couple of days cover the jelly over with white notepaper dipped in the white of an egg, and cover with tin or glass covers; if you have no covers, tie or paste paper over the tops of the glasses.

GRAPE JELLY.—Heat ripe black grapes over a slow fire, stirring and mashing them until they burst and until the juice runs out. Strain through a thin muslin bag without pressing them. Return the juice to the fire and boil rapidly twenty minutes; then stir into it two heaping teacupfuls of white cane sugar to three cups of juice. Boil briskly fifteen minutes after adding the sugar, skimming carefully and stirring it while boiling. Remove and pour into glasses before the jelly begins to cool.

GRAPE CATSUP.—Squeeze the pulp from 5lbs. of grapes; boil this for five minutes, or until the seeds can be strained out, using a porcelain potato masher to press the pulp through the sieve; add 2lbs. of cane sugar, the skins, one cup of vinegar, a teaspoonful each of allspice and cinnamon, a saltspoonful each of mace and clover, and half a teaspoonful of salt; add the spices in bags, and boil until it thickens. Add a little cayenne pepper at the last. It is delicious with cold meats.

GRAPE JAM.—Use ripe or green grapes. Pulp the fruit, put skins in one basin and the pulp in a preserving pan and bring to boil, then press it through a colander, add skins, and measure. For ripe fruit allow $\frac{1}{2}$ lb. of sugar to each pint, and for green grapes $\frac{3}{4}$ lb. Put into pan and boil rapidly for twenty minutes, stirring occasionally.

UNFERMENTED WINE.—Press out the juice, strain through flannel bag, place in bottles, and raise the temperature slowly to 180°F. by putting the bottles up to the necks in pan or tank of water and bringing to boiling point. When the juice reaches 180°F., cork and seal and remove from fire. If the temperature is allowed to rise higher the liquor has a cooked flavor. This will not keep long after being opened. For use dilute water to taste.

SPICED GRAPES.—Stem and wash the grapes, and boil them until they are soft; press through a coarse sieve, and to every 10lbs. of pulp add 5lbs. of cane sugar, one tablespoonful of cinnamon, a large teaspoonful each of cloves and spice, half a small teaspoonful of pepper, grated nutmeg, and 2qts. vinegar. Boil this slowly until it becomes as thick as catsup, and bottle the same. With boiled or roast meats this is very nice.

UTILISATION OF TOMATOES.

The following are tested recipes for high-class products in which tomatoes form the base :—

GREEN TOMATO CHUTNEY.—Slice 1gall. green tomatoes, put a handful of salt to each layer, let stand three hours; then strain off the liquor, add a little cayenne pepper (say $\frac{1}{2}$ oz.) and four onions thinly sliced. Take 2qts. good vinegar, $1\frac{1}{2}$ pts. treacle, two tablespoonfuls dry mustard, one of allspice, one of cloves, and heat in a preserving pan until the vinegar begins to boil; then put in the tomatoes, onions, &c., let boil half an hour, stir often; put in jars, close, and seal whilst quite hot.

RIPE TOMATO CHUTNEY.—Six pounds tomatoes peeled, $1\frac{1}{2}$ lbs. acid apples peeled and cored, 9ozs. stoned raisins, 8ozs. currants, 2ozs. lemon peel, 6lbs. brown sugar, 3ozs. chillies, 3ozs. bruised ginger, $1\frac{1}{2}$ ozs. garlic, $\frac{1}{4}$ lb. onions, 4ozs. grated horseradish, a small bunch mint. Chop all coarsely, mix with $1\frac{1}{2}$ pts. vinegar, add $\frac{1}{2}$ pt. limejuice. Simmer in a saucepan till the mixture is clear, of a syrupy consistence, but do not cook till too soft. Place in jars and close up whilst quite hot.

BEST TOMATO SAUCE.—Procure 15lbs. tomatoes (small varieties if possible), $1\frac{1}{2}$ lbs. onions, $1\frac{1}{2}$ lbs. apples, $1\frac{1}{2}$ lbs. sugar, 1lb. salt, $1\frac{1}{2}$ oz. garlic, 1oz. ground ginger, $\frac{1}{2}$ oz. cayenne pepper, 1oz. white pepper, $\frac{1}{2}$ oz. cloves, 1oz. ground allspice, $1\frac{1}{2}$ pts. vinegar. Break the tomatoes, peel and cut up the apples, onions, and garlic, and place with the cloves in an enamelled pan or copper and boil till soft enough to pass through a fine sieve or colander. Put back in the pan, add the other spices after mixing them well with the vinegar to prevent lumpiness. Boil until thick enough, stirring very often; bottle and cork whilst hot.

TOMATOES for cooking, for jams, or preserves, or canning, should always be scalded and skinned before anything else is done with them.

PICKLED TOMATOES.—Take small red or yellow tomatoes, prick them with a pin, place in moderate size glass or stone jars, add a dozen chillies for each 4lbs. tomatoes, cover with cold strong vinegar, cover down closely. Ready for use in two weeks, but will keep six months.

GREEN TOMATO PICKLES.—Pick the tomatoes before they begin to ripen. Take off the stems and wash. Cut in slices not too thin, and put in a jar, with salt between the layers, and leave for twenty-four hours. Strain through a colander. Prepare vinegar in a porcelain kettle, and, when boiling, put in as many tomatoes as will cook well. Be careful not to leave them in long. Skim out into a colander, and drain before putting them in a jar. After they are cooked prepare new vinegar. To every 4qts. add 2lbs. of brown sugar, 1oz. of old cloves, 2ozs. of ground cinnamon tied in a bag, five or six large green peppers (seeds taken out), chopped fine. Boil together in vinegar for fifteen minutes, and when nearly cold pour on the tomatoes.

CHOW-CHOW.—Half a bushel green tomatoes, 1doz. onions, 1doz. green peppers, chop all fine. Sprinkle well with 1pt. salt. Let stand over night, drain off the liquor and cover instead with good vinegar. Cook slowly one hour, then place in jars. Take 2lbs. sugar, two tablespoonfuls each cinnamon and allspice, one tablespoonful each of cloves and pepper, half a cup of ground mustard, 1pt. grated horseradish, and enough vinegar to mix them. Boil well, and mix with the ingredients in the jars. Ready for use in two days.

TOMATO CATSUP.—Scald and peel ripe tomatoes, sprinkle with salt, let stand for a night, strain through a sieve to take out the seeds. For each quart add 1oz. cloves, 1oz. black pepper, one grated nutmeg, a little cayenne pepper, and salt if needed. Boil for half an hour. Cool it, add 1pt. cider vinegar or other strong vinegar. Bottle whilst quite hot, cork closely, and keep in a cool place.

TOMATO SOUP.—In making any kind of soup, always use cold water; skim well, especially during the first hour. To assist the scum in rising pour in a little cold water occasionally, and skim thoroughly just when the liquid begins to boil again. Use salt sparingly and season lightly with pepper. Allow 1qt. soup to three or four persons. For tomato soup take 1gall. of stock, made from beef, to 3qts. fresh tomatoes, scalded and peeled; reject the hard centre. force through a fine sieve, and add to the stock; make a paste of butter and flour, and when the stock begins to boil stir in half a cupful of the paste, taking care not to have it lumpy; boil twenty minutes, season with pepper as needed.

TOMATO FIGS.—Take 6lbs. ripe smooth tomatoes, scald and remove skins. Place layer of tomatoes in preserving pan, strew thickly with sugar, place over moderate fire, and stew very slowly until the sugar appears to penetrate the tomatoes. Lift each fruit out carefully, spread on dishes, and stand in hot sun for a day or two to dry. Sprinkle several times during drying with granulated sugar. When perfectly dry, pack in jars with layers of sugar between each layer of fruit.

TOMATO CATSUP.—Cut ripe tomatoes into slices and pack in jar in layers with salt between each layer. Let stand for three days, then press through sieve, and add spices and vinegar to taste. Bottle and seal.

RIPE TOMATO PRESERVE.—Select smooth but not overripe tomatoes, scald and peel. To each pound of fruit allow 1lb. sugar, the juice and rind of half a lemon, and a small piece of ginger-root cut in thin slices. Cook gently for three hours; the tomatoes should not lose their shape, but be clear and tender. Put into tumblers or jars, and when cold cover with two thicknesses of tissue paper and moisten top with water or white of egg; when dry, place in cool dark place to keep.

CANDYING FRUIT.

The British Consul at Leghorn furnishes an interesting report to the British Government on the fruit-candyng industry in Italy, from which the following is abstracted :—

“The fruit is simply halved and placed in hogsheads or large casks filled with a fairly strong solution of brine; the fruit being halved merely to ensure the thorough preservation of the rind by an equal saturation of the interior as well as the exterior surface. In these casks it arrives at the doors of the manufactory. The first process to which it is then subjected is the separation of the fruit from the rind. This is done by women, who, seated round a large vessel, take out the fruit, skilfully gouge out the inside with a few rapid motions of the forefinger and thumb, and, throwing this aside, place the rind unbroken in a vessel alongside them. The rind is next carried to large casks filled with fresh cold water, in which it is immersed for between two and three days to rid it of the salt it has absorbed. When taken out of these casks the rinds are boiled, with the double object of making them tender and completely driving out any trace of salt which may still be left in them. For this purpose they are boiled in a large copper cauldron for a time varying from one to two hours, according to the quality of the fruit and the number of days it has been immersed in brine. When removed from this cauldron the peel should be quite free from any flavor of salt, and at the same time be sufficiently soft to absorb the sugar readily from the syrup, in which it is now ready to be immersed. The next process to which the rind is subjected is that of a slow absorption of sugar. This occupies no less than eight days. It is needless to say that the absorption of sugar by fresh fruit in order to be thorough must be slow, and not only slow, but gradual—that is to say, the fruit should at first be treated with a weak solution of sugar, which may then be gradually strengthened, for the power of absorption is one which grows by feeding. The fruit (and this holds good more especially with the rind) would absorb with difficulty and more slowly and unequally if plunged at once into a thick syrup than if gradually treated with weak solution, easier of absorption, and by which it has been thoroughly permeated first. It is a knowledge of this fact which governs the process I now describe. The fruit has now passed into what I may call the saturating-room, where on every side are to be seen long rows of immense earthenware vessels about 4ft. high and 2½ft in extreme diameter, in outline roughly resembling the famed Etruscan jar, but with a girth altogether out of proportion to their height, and with very short necks and large open mouths. All the vessels are filled to their brims with citron and orange peel in every stage of absorption, *i.e.*, steeped in sugar (syrup of) roughly speaking eight different degrees of strength. I said before that this is a process which occupies almost always eight days; and, as the syrup in each jar is changed every day, we may divide the mass of vessels before us into groups of eight. Take one group of this number, and we are able to follow the fruit completely through this stage of its treatment. With vessels of such great size and weight, holding at least half a ton of fruit and syrup, it is clearly easier to deal with the syrup than with the fruit. To take the fruit out of one solution and to place it in the next stronger, and so on, throughout the series would be a toilsome process, and one, moreover, injurious to the fruit. In each of these jars, therefore is fixed a wooden well, into which, a simple hand suction pump being introduced, the syrup is pumped from each jar daily into the adjoining one. ‘How is the relative strength of the syrup in each jar regulated?’ is the next question. ‘The fruit itself does that,’ is the foreman’s reply; and this becomes clear from the following explanation: Number your group of jars from 1 to

8 respectively, and assume No. 1 to be that which has just been filled with peel brought straight from the boiler, in which it has been deprived of the last trace of salt, and No. 8 to contain that which, having passed through every stage of absorption but the last, is now steeped in the freshly-prepared and, therefore, the strongest solution of syrup used in this stage. 'We prepare daily a syrup of the strength of 30°, measured by the "provino," a graduated test for measuring the density of the syrup,' continued the foreman, 'and that is poured upon the fruit in jar No. 8. To-morrow the syrup from this jar, weakened by the absorption from it, by the fruit, of a certain proportion of sugar, will be pumped into jar No. 7, and so on daily through the series. Thus, No. 1, containing the fruit itself, regulates the strength of the syrup, as I said.' 'But if the syrup has lost all its strength before the seventh day, or arrival at jar No. 1?' we ask. 'Care must be taken to prevent that by constant testing with the "provino,"' is the reply, 'and if that is found to be the case a little stronger syrup must be added to the jar.'

'A slight fermentation next takes place in most of the jars. But this, so far from being harmful, is regarded as necessary. Of course, it must not be allowed to go too far. There is yet another stage, and that, perhaps, the most important, through which the peel has to pass before it can be announced sufficiently saturated with sugar. It is now boiled in a still stronger syrup of a density of 40° by the testing tube, and this is done in large copper vessels over a slow coke fire—care being taken to prevent the peel from adhering to the side of the vessel by gentle stirring with a long, paddle-shaped ladle. The second boiling will occupy about an hour. Taken off the fire, the vessels are carried to a large wooden trough, over which is spread a coarse, open wire netting.

'The contents are poured over this and the peel distributed over the surface of the netting, so that the syrup—now thickened to the consistency of treacle—may drain off the surface of the peel into the trough below. The peel has now taken up as much sugar as is necessary. Now comes the final process—the true candying or the covering of the surface of the peel with the layer of sugar crystals which is seen upon all candied fruit. To effect this a quantity of crystallised sugar—in Leghorn the same quality of sugar is used as is employed in the preparation of the syrup—is just dissolved in a little water, and in this the now dried peel, taken off the wire netting, is immersed. The same copper vessels are used, and the mixture is again boiled over a slow fire. A short boiling will suffice for this, the last process, for the little water will quickly be driven off, and the sugar upon cooling will form its natural crystals over the surface of the fruit. Poured off from these vessels, it is again dried upon the surface of the wire netting as before described. The candying is now complete and the candied peel is ready for the packing-room, to which it is carried off in shallow baskets.

'In the packing-room may be seen hundreds of boxes of oval shape, or, if I may so speak, of rectangular shape, with rounded corners and of different sizes. Each country prefers its boxes to be of a particular weight, Hamburg taking the largest, of 15 and 30 kilos, the United States of America preferring smaller, of 10 to 12 kilos; Britain takes the smallest, of 5 kilos, and one containing about seven English pounds. The wood on which the top and bottom of these boxes are made comes to us in thin planks from Trieste, and skilful packing is usually done by women—the boxes being lined with white paper. They are then packed in cases of 100 kilos, ten of the smaller American boxes filling a case. The candied peel is now ready for export.'

OPHTHALMIA.—Bathe the eyes three times a day with 4ozs. of tincture of opium in a quart of water. If possible, keep the animal in the shade; and, if milch cows, keep a damp cloth over the eyes, and moisten it occasionally.

ORCHARD NOTES FOR FEBRUARY.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

The season is proving a trying one for the orchardists of this State. Long spells of cool weather recurring between short sharp outbursts of heat do not make ideal conditions for the welfare of the trees. At the time of writing these notes reports are coming in from all directions of heavy losses from wind storms. In ordinary seasons the time for cultivation usually passes away with the bending of the fruit-laden boughs after midsummer. Where it is possible, however, every effort should be made to retain the moisture throughout the summer in orchards now in full bearing. With such fruits as late pears and apples the trees are now being put to a severe test where anything like a full crop is carried. We should always remember these trees have not only to bring the crop to maturity, but to develop the flower buds for the next season practically at the same time. In the case of apple trees every exporter knows that if sufficient moisture is available to the roots the small fruits continue to develop after each picking off of the more matured specimens. We may therefore conclude that it is wise in such cases to retain the soil mulch intact, or renew it by cultivating should rain fall or water be applied artificially.

In the case of young orchards, where the trees have reached a normal size but have not yet borne good crops, a different course is advisable. The early ripening of the wood, owing to the slackened flow of sap, due mainly to a receding supply of moisture around the roots, is a desirable condition in such trees. It is desirable because such trees are too vigorous, and the continuance of rank growth is not conducive to the formation and development of flower buds. The newly-planted orchard requires as much attention in the direction of retaining moisture in the soil as that composed of trees in full bearing. While the tree is yet in the course of building great vigor is essential. Where water is available for irrigating more certain results are obtainable in fruit culture. At this period the loquat is putting out new growths, and needs assistance. The spur growths upon the apricot will be improved and strengthened by the application of moisture to average apricot lands. Mid-season peach trees from which the fruits are now gathered will in most instances benefit by a little more than natural moisture, while the fruits of the latest kinds, such as Lady Palmerston and Salwey, will greatly benefit, and the chances of obtaining a crop from the trees next season be improved by giving them a watering now. The soil in the citrus plantation should never reach that stage of dryness when the leaves of the trees curl inwards. To avoid this, test the moisture of the ground by digging holes reaching into the subsoil. Take a handful of the subsoil and squeeze it as tightly as possible in the closed hand. If on relaxing the pressure gently it falls into powdery form there is insufficient moisture in the soil. There is little question that much of the unfruitfulness of our citrus trees is due to ill-considered treatment. The vegetative functions are encouraged or discouraged spasmodically, and in consequence there is not that steady flow of sap throughout the trees that is consistent with fruitful progress. In the case of citrus trees in full bearing no attempt should be made to stimulate strong growth during midsummer, but the fruits should make steady progress and the leaves maintain their elaborating functions to the utmost degree. Young trees not yet in bearing do not take any harm from summer stimulation, though such a course may anticipate or belate the natural growth of autumn. In districts where early frosts are feared there is an advantage in securing proper hardening of the autumn growth early. This probably is best attained by anticipating the period of the natural development of the autumn by causing a summer growth.

In some of the later districts the fracturing of the rank laterals of the apple and pear trees will probably be undertaken during this month, the object aimed at being to transform the rank unfruitful lateral into valuable spur-carrying wood. It is therefore not applied to the leading shoots, and is only profitable and desirable when practised upon young or other vigorous unfruitful rank-growing trees. Like many other operations in the orchard, the only accurate guide as to when it shall be done is the vegetative condition of each tree. The ideal condition is found when the flow of sap has begun to slacken, and the growing points of the shoots harden into a tough fibrous state. The method commonly in vogue is to break the lateral above the second or third bud from its base, and allow the half-severed portion to hang until the winter pruning season arrives.

This is about the best time of the year to insert buds, which shall remain dormant over the winter. The actual operation of inserting the buds is well and widely understood, but the selection of the buds calls for more judgment. Beyond any increased or diminished vigor that the stock may infuse into the growths therefrom, and slight changes of quality or period of ripening consequent upon this, the tree rising from the bud will almost inevitably reproduce the exact characteristics of its parent shoot. We should, therefore, be sure to take buds from not only highly prolific trees of good quality, but from limbs that are known to possess these characteristics in the highest degree.

In many orchards where peach trees are grown not enough consideration is given to the question of the admission of light to all parts of the tree. This defect may be found in the training of most kinds of trees, but more particularly in that of the peach. Although somewhat late in the season to realise the full benefit therefrom, the work of thinning out surplus branches should be undertaken without delay. The centre should be kept free of strong upright growths. The laterals upon the season's leaders should be spaced by removing completely from one-third to one-half of their total number. This will allow the light to penetrate and assist in ripening the wood and buds upon those retained.

The drying of sultana, currant, and muscatel grapes will be undertaken soon, and care should be taken by beginners not to gather too soon. The ripeness of currants and muscats are readily gauged, but sultanas are not ready to gather when merely sweet enough to be palatable. They should reach a rich sweet condition usually indicated by a deep amber-colored skin.

The patchy crop and the violent storm experienced recently will cause late apples to be very scarce here this season. The local price must rule high, consequently the quantity available for export will be below the average of past seasons. This is particularly unfortunate owing to the comparative shortage of American exports to England during the season now ending. After a shortage from American sources our apples usually sell well in London. The value of the local crops will be also diminished by the ravages of fusiladium and codlin moth. The latter pest is gradually spreading to all the orchard districts of this State, and the trouble is becoming more serious year by year. The utmost care should be taken at this period in the direction of gathering infested fruits and trapping the caterpillars in bandages.

In no instance is the truth of the old proverb, "A bird in the hand is worth two in the bush," more abundantly verified than in picking off the fruits while the caterpillar is yet inside of them. If allowed to come out it may seek the bandage for shelter, or it may not, but when secured in the fruit it remains with the orchardist whether escape is possible. At this stage the insect often profits at the expense of the orchardist. The apples collected are heaped against the pigstye or cow byre for gradual consumption by the animals, and the insect takes advantage of the respite to escape into the sheds or any other

cover at hand. Again when the apples and pears are harvested and stored whilst the insect is inside of the fruit, it emerges when fully grown, to harbor in the building, and in due time emerges as a moth, to perpetuate its species and the damage inseparable from its existence. The remedies for these evils should not need recapitulation.

Several pretty large growers are testing the value of the arsenite of soda (Kedzie's formula) spray this season in the hills near Adelaide. The results up to the present are distinctly encouraging. I would suggest that another spraying be given to late apples and pears during this month, as it is better to wipe the spray off when marketing than to lose the fruits by the latest brood of caterpillars.

NOTES ON VEGETABLE-GROWING FOR FEBRUARY.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

Upon the open plains country where water for irrigating is available a start to plant and sow vegetables for early winter gathering will be made. The preparation of the soil is of the utmost importance. For vegetable production it should be deeply prepared. A mellow, freely-worked, sweet loam, rich in organic matter, is desirable. If the subsoil is composed of stiff clay it is wise to bring up an extra $\frac{1}{2}$ in. of it each year, and thoroughly incorporate it with the surface soil. By this means the depth of good soil is increased gradually. If the surface soil is stiff, or tends to bake, good rotted vegetable matter or farm-yard manure should be added, and thoroughly mixed into the soil. This will add humus and increase the moisture-holding capacity of the land. As most of our soils are deficient in phosphoric acid, a dressing of bonedust or superphosphate is highly necessary. At this time of the year the ground is naturally very dry, and cannot be worked to the best advantage in that condition. Several days before it is to be dug or ploughed spread the manure and thoroughly soak the ground. As soon as it is dry enough to work it should be dug or ploughed, and thoroughly pulverised, mixed, and broken up. The surface should then be made even, and sown or planted. After this all spaces between the rows of plants or drills of seed should be loosened up and completely pulverised to retard rapid evaporation. There is no phase of garden work of greater importance than the proper preparation of the soil prior to planting.

In growing vegetables it is well never to forget that their value depends upon being quickly grown. Only the succulent cellular portions are valued, and if the flow of sap is checked fibrous tissue is formed and with most kinds some sort of undesirable principle accumulates. We have these illustrated in the "stringiness" of the bean or turnip, and the "bitterness" of the lettuce or the "hot" flavor of the radish. To maintain constant and rapid growth there must be a suitably rich soil, sufficient air, light, moisture, and a proper degree of temperature. The first is provided by good cultivation and manuring; the aeration is also dependent upon the sweetness of the soil. The light is admitted chiefly by the proper spacing of the plants, and the moisture by rainfall or irrigation. The regulating of the temperature of the ground may be largely accomplished by the manner in which the above operations are carried on. We cannot readily, or rather profitably, regulate the temperature of the whole atmosphere covering the garden, but we can grow such plants as experience has taught will thrive in the temperature prevailing during certain periods of the year.

The last sowing for the season of dwarf or runner beans will be made during February. If sown upon ground prepared as described herein, and mulched an inch deep with broken manure, or, say, buffalo grass clippings, no further

watering should be required until the plants appear through the soil. Beans should never be permitted to "flag" for the want of moisture, and pods should never be allowed to develop plump seeds.

On the plains the first sowing of peas will be made. As soon as the plants appear above the soil protection against sparrows must be provided. In small gardens a single thread of black cotton stretched along about an inch above the plants in the rows usually scares them away until the foliage hardens.

Sowings will also be made of carrots, parsnips, turnips, beets, radishes, and prickly spinach. All root crops succeed best upon soil which has been heavily manured at the beginning of the previous season and from which a crop of cabbages, potatoes, or other rank-feeding vegetables has been taken.

In seed beds successional sowings should be made of cabbage, onion, cauliflower, Brussels sprouts, lettuce, celery, and kohlrabi.

Young seedlings (excepting onions) from former sowings should be thinned out to a couple of inches apart so that sturdy well-rooted plants may be set out. Such plants, lifted with earth-covered roots, will become established after transplanting more quickly during some cool spell than the spindly objects plucked from a crowded seed bed. The early crop is usually subjected to insect attacks and climatic disabilities more than later plantings; consequently they are usually scarcer and more profitable when produced.

Tomatoes and all kinds of melons require abundance of water now. An occasional sprinkling of superphosphate washed into the soil near the roots will be relished and help in sustaining the fruiting powers of these plants. Cut away marrows, pumpkins, and cucumbers as soon as they are sufficiently developed. This helps the plants to carry the smaller and later-formed fruits to greater perfection.

Rhubarb plantations require some attention, though forcing is to be deprecated. The plants require a little water occasionally, and all flower stalks should be suppressed.

As soon as the stalks of the asparagus plants begin to turn yellow they may be cut away without injury to the plants. This often prevents a host of seeds being dropped upon the bed. These give rise to young plants which often prove a thorough pest.

In every garden there should be a compost pit, into which all other than diseased vegetation should be cast. If mixed with wood ashes, slops, fowl or cow manure, wood heap refuse, and an occasional covering of good garden loam a splendid compost may be formed. Such a mixture, if turned occasionally to admit of proper aeration, will, when decomposed, produce a lot of plant food in a readily available form which may be safely and profitably applied to flower, vegetable, or fruit garden.

FORESTS AND RAINFALL.

By W. L. SUMMERS.

During the past year the question of the effect of the denudation of our forests has received considerable attention at the meetings of the Agricultural Bureau, and some statements have been made concerning the subject which will not apparently bear investigation. It is frequently stated that the wholesale destruction of timber in the clearing of land for wheat-growing, the ring-barking of trees to improve the grazing capacity of the land, as well as the cutting of firewood, sleepers, &c., has had the effect of lessening our annual rainfall. A chance remark of the editor's led me to look up our rainfall records, particulars being obtained from the Adelaide Observatory through the courtesy of Sir Chas. Todd, K.C.M.G., &c.

The first table contains the rainfall records for each year from 1839 to 1898, divided also into periods of ten and thirty years for comparison. The average rainfall for sixty-three years at Adelaide is 20·82in. The fall during the past three years has been—1899, 18·84in.; 1900, 21·68in.; 1901, 18·01in.

ADELAIDE.

Year.	Rainfall.	Average for Ten Years.	Year.	Rainfall.	Average for Ten Years.	Year.	Rainfall.	Average for Ten Years.
1839	19·84	—	1849	25·44	—	1859	14·46	—
1840	24·23	—	1850	19·56	—	1860	18·50	—
1841	17·96	—	1851	30·86	—	1861	24·04	—
1842	20·32	—	1852	27·44	—	1862	21·85	—
1843	17·19	—	1853	27·08	—	1863	23·68	—
1844	16·88	—	1854	15·35	—	1864	19·75	—
1845	18·83	—	1855	23·14	—	1865	15·51	—
1846	26·88	—	1856	24·93	—	1866	20·11	—
1847	27·61	—	1857	20·15	—	1867	19·05	—
1848	19·74	20·95	1858	20·25	23·42	1868	19·99	19·69
Total for thirty years, 640·62in.			Average, 21·35in.					
1869	14·74	—	1879	20·69	—	1889	30·87	—
1870	23·84	—	1880	22·48	—	1890	25·78	—
1871	23·25	—	1881	15·02	—	1891	14·00	—
1872	22·66	—	1882	15·70	—	1892	21·52	—
1873	21·00	—	1883	26·76	—	1893	21·48	—
1874	17·23	—	1884	18·74	—	1894	20·78	—
1875	29·21	—	1885	15·89	—	1895	21·28	—
1876	13·43	—	1886	14·42	—	1896	15·17	—
1877	24·95	—	1887	25·70	—	1897	15·42	—
1878	22·08	21·24	1888	14·55	19·30	1898	20·75	20·71
Total for thirty years, 612·39in.			Average, 20·41in.					

Looking at these figures it will be seen that the average for the first thirty years was 21·32in., and for the second period 20·41in., not quite 1in. less. Taking the sixty-two years from 1839 to 1900 in two periods of thirty-one years each we have an average fall for the first period of 21·14in., and for the second of 20·59in., the first being 0·32in. above the average of sixty-three years, and the second 0·23in. below.

Let us look at the figures from another point of view. We will take the average rainfall as 21in. for convenience. Anything above 22in. might be termed wet years, and below 20in. dry years. Dealing with the ten year periods we have—First period, six dry years, three wet years; second period, two dry years, six wet years; third period, six dry years, two wet years—total, fourteen dry years, eleven wet years; fourth period, three dry years, four wet years; fifth period, six dry years, two wet years; sixth period, three dry years, two wet years—total, twelve dry years, eight wet years. It will be seen, therefore, that while the first thirty years has a slightly higher average rainfall, it also had two more dry years and three more wet years than the second thirty years. If any deduction can be drawn from these figures, it seems that the rainfall during the second period has been more regular than during the first period of thirty years.

The following tables give the rainfall since records have been kept at Wallaroo, Koorunga, Kapunda, Meningie, and Mount Gambier. These have been divided in each case into three periods, and the average of each period shown for comparison. It will be seen that with Wallaroo and Koorunga the first periods have the lowest average, and at these two places and at Kapunda the averages for the third period are greater than the averages for the first period. With Meningie and Mount Gambier the opposite is the case; but at the Mount the rainfall in 1851 was 22in. above the average, and more than accounts for the

discrepancy between the two periods, which only averages 1·5in. The rainfall records for Gladstone, Orroroo, Balaklava, Quorn, Carrieton, and several other northern stations were obtained, but as they only go back twenty to twenty-five years they are of little value to anyone dealing with the subject under consideration.

Taken altogether it will, I think, be admitted that these figures afford no proof that our rainfall has decreased with the denudation of our timbered country. One thing, however, must be borne in mind, and that is in talking of the effect of forests on rainfall and on climate we deal with two distinct points. There can be no question of the value of timbered country in mitigating climatic conditions; positive evidence on this point is furnished in every part of the world.

WALLAROO.

Year.	Rainfall.	Average for Thirteen Years.	Year.	Rainfall.	Average for Thirteen Years.	Year.	Rainfall.	Average for Twelve Years.
1864	12·18	—	1877	17·80	—	1890	15·61	—
1865	8·03	—	1878	13·17	—	1891	11·47	—
1866	13·22	—	1879	13·78	—	1892	17·40	—
1867	14·12	—	1880	17·89	—	1893	16·36	—
1868	12·49	—	1881	9·99	—	1894	13·23	—
1869	12·26	—	1882	10·26	—	1895	13·40	—
1870	16·64	—	1883	19·39	—	1896	12·52	—
1871	13·34	—	1884	13·05	—	1897	8·57	—
1872	17·20	—	1885	10·78	—	1898	14·60	—
1873	11·48	—	1886	8·73	—	1899	9·75	—
1874	11·38	—	1887	15·55	—	1900	11·62	—
1875	20·18	—	1888	7·80	—	1901	14·24	13·23
1876	8·84	13·18	1889	22·62	13·91			

KOORINGA.

Fourteen Years.			Fourteen Years.			Fifteen Years.		
1859	9·75	—	1873	14·16	—	1887	22·56	—
1860	13·98	—	1874	22·04	—	1888	11·84	—
1861	17·13	—	1875	21·78	—	1889	27·86	—
1862	12·62	—	1876	12·97	—	1890	26·13	—
1863	22·55	—	1877	21·14	—	1891	13·34	—
1864	13·98	—	1878	19·03	—	1892	19·51	—
1865	10·32	—	1879	21·12	—	1893	21·00	—
1866	16·96	—	1880	19·50	—	1894	23·03	—
1867	24·61	—	1881	16·79	—	1895	15·67	—
1868	16·27	—	1882	14·51	—	1896	12·83	—
1869	11·92	—	1883	18·06	—	1897	14·48	—
1870	26·10	—	1884	19·88	—	1898	16·93	—
1871	19·25	—	1885	14·92	—	1899	15·36	—
1872	18·81	16·74	1886	14·89	17·91	1900	17·93	—
						1901	15·56	18·46

KAPUNDA.

Fourteen Years.			Fourteen Years.			Thirteen Years.		
1861	20·83	—	1875	32·16	—	1889	29·50	—
1862	21·05	—	1876	17·26	—	1890	28·64	—
1863	24·94	—	1877	21·44	—	1891	14·17	—
1864	13·79	—	1878	16·37	—	1892	20·07	—
1865	13·23	—	1879	20·86	—	1893	24·78	—
1866	17·83	—	1880	20·25	—	1894	23·44	—
1867	23·16	—	1881	15·78	—	1895	15·84	—
1868	18·06	—	1882	14·20	—	1896	14·14	—
1869	14·98	—	1883	21·72	—	1897	14·62	—
1870	25·45	—	1884	19·70	—	1898	20·45	—
1871	22·29	—	1885	14·18	—	1899	16·37	—
1872	19·12	—	1886	17·54	—	1900	22·46	—
1873	20·34	—	1887	20·28	—	1901	17·09	20·12
1874	23·72	19·75	1888	13·85	18·97			

MENINGIE.

Year.	Rainfall.	Average for Thirteen Years.	Year.	Rainfall	Average for Thirteen Years.	Year.	Rainfall.	Average for Twelve Years.
1864	20.28	—	1877	20.93	—	1890	20.30	—
1865	12.86	—	1878	19.35	—	1891	13.52	—
1866	19.62	—	1879	16.40	—	1892	17.72	—
1867	18.91	—	1880	18.99	—	1893	18.42	—
1868	17.31	—	1881	16.80	—	1894	15.78	—
1869	16.05	—	1882	16.19	—	1895	16.01	—
1870	25.72	—	1883	21.92	—	1896	15.58	—
1871	23.03	—	1884	22.30	—	1897	13.00	—
1872	21.76	—	1885	17.33	—	1898	17.62	—
1873	22.91	—	1886	15.26	—	1899	18.76	—
1874	14.97	—	1887	23.47	—	1900	20.26	—
1875	22.30	—	1888	15.40	—	1901	17.91	17.40
1876	15.97	19.36	1889	26.73	19.23			

MOUNT GAMBIER.

Fourteen Years			Fourteen Years.			Thirteen Years.		
1861	55.68	—	1875	34.19	—	1889	41.33	—
1862	32.82	—	1876	25.47	—	1890	32.83	—
1863	43.96	—	1877	21.52	—	1891	28.51	—
1864	31.86	—	1878	25.27	—	1892	29.37	—
1865	32.85	—	1879	27.38	—	1893	37.75	—
1866	33.05	—	1880	33.54	—	1894	36.24	—
1867	28.70	—	1881	27.29	—	1895	35.43	—
1868	27.62	—	1882	23.10	—	1896	31.23	—
1869	24.57	—	1883	34.03	—	1897	24.69	—
1870	37.48	—	1884	35.30	—	1898	27.82	—
1871	30.44	—	1885	29.22	—	1899	30.79	—
1872	33.00	—	1886	30.94	—	1900	29.17	—
1873	30.41	—	1887	31.51	—	1901	32.42	32.12
1874	28.01	33.60	1888	30.41	29.25			

POULTRY NOTES.

By D. F. LAURIE.

NOTE.—Letters of inquiry, &c., should be addressed to me, c/o Engineer-in-Chief's Office, Adelaide, enclosing stamped envelope if reply required.

Poultry Diseases.

The articles on poultry diseases will be continued in next issue, as it is intended to publish a complete description, with treatment, for the general guidance of breeders.

A Visit to Melbourne.

The breeders in the other States enjoy many advantages and are much more advanced than is the case here. I have on various occasions described the superior quality of the birds to be seen in hundreds of poultry establishments there, and hope to see the same results here very soon. I was glad to be able to tell my Victorian friends that great advances have of late been made in South Australia, and that doubtless ere long we shall export largely of poultry as well as eggs.

The Government freezing works were naturally visited by me. Mr. A. Hart, the Victorian expert, showed me large quantities of poultry in various stages preparatory to shipment to West Australia and South Africa, and I was pleased to note the steady increase of the trade. My attention was again drawn

to the official figures, which place the value of the poultry industry in Victoria at two millions (£2,000,000) sterling annually, a sum which exceeds the wool exports.

As previously stated, the American poultry industry is calculated at sixty millions (£60,000,000) pounds sterling per annum, exceeding most other branches of rural industry. We must awaken to the importance of the poultry trade, and no longer allow ourselves to be looked upon as the lame duckling of the Australian States.

Poultry diseases form part of Mr. Hart's studies, and he has made a most valuable and unique collection of specimens taken from birds brought to the works for freezing. Among them are instances of cancer, hydatids, tuberculosis, elephantiasis, and even a specimen of a bird badly infested with tick (*Argas reflexus*). I should like to see a similar collection in Adelaide, where it could be viewed by those interested, and I should also like a little more attention from the health authorities with a view to assisting in stamping out disease generally. The poultry industry is too great to be allowed to perish for want of a little precise knowledge. The whole question is largely one of education, and the Victorian and New South Wales authorities recognise this fully and are acting briskly.

Victorian Poultry Lectures.

Mr. W. T. Wright, agricultural editor of *The Leader*, and one of the most prominent poultry specialists and judges in Victoria, gave me an interesting account of a series of lectures given by him to large and interested audiences at the Working Men's College. On Saturdays it was his custom to take large parties to some of the principal poultry-breeding establishments, these visits forming most valuable object lessons. He expressed surprise that after making a beginning the South Australian authorities had ceased off, and called attention to the continuous work carried on by the county councils in England.

A matter we discussed was an important one, viz., the best means of collecting eggs and birds for sale in city or for export. I told him of our splendidly-organised Agricultural Bureau system, and he at once said that we had all the machinery essential to success. I was reluctant to say that while this was evident I had not discovered the oil of inducement which would lubricate this machine; and, although the more intelligent portion of our farmers were keeping pace with modern usages in farming, and were recognising the value of poultry, still there was a strong element apparently insoluble. The difficulty in the egg trade is the matter of collection. With modern methods of preservation the producer could gain a much better price with a little concentration. Each Branch Bureau could appoint some person to receive or even collect the eggs, pack and forward them, and pay a sum which would be satisfactory. The same might be done as regards table poultry in those localities not too far removed from the railway. I cannot understand the apathy of those who, especially in favored districts, allow such a source of wealth to remain undeveloped. Co-operation in collecting and marketing produce is a subject more worthy the attention of the Branches than many others I see discussed. Co-operation and combination in this direction would soon show the value of the poultry industry, and we should export treble the value in eggs, and the dead frozen poultry would soon exceed mutton and lambs. It is not as if there were no market: there is a vast and increasing market, whereas we have to compete in many other lines against superior odds.

The Poultry Tick.

This scourge has been found in Melbourne, where it evidently was brought from the north of Victoria. Great consternation is evident among the local breeders, and I was plied with numerous questions as to the state of the case here. A further report of my efforts in this direction will appear later on.

Naturally I visited a few prominent poultry-breeders, and inspected a lot of very high-class poultry, about which I shall talk later on. I inquired also into artificial incubation, and found that, whereas they smiled at me when I told them seven years ago that they must have recourse to incubators, they now one and all recognise the fact, and I saw numerous Australian and American machines. I am glad to report that my strong advocacy of pure-bred high-class poultry met with much support, and ample proof of the soundness thereof was forthcoming. I have always urged the inadvisability of continual and miscellaneous crosses, as such are no more nor less than the undoing of years of patient breeding.

My own operations this season have been with birds of the very highest class, and better laying could not be wished, and as for fecundity there was no complaint; one had seventeen chicks from seventeen eggs, and the growth is remarkable. This is largely due to mating and correct feeding of the breeding stock. I shall have no room for cross-breds in future unless it be with the old English Game which I expect from England ere this appears in print, and of which more anon.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Company report :—

February 1, 1902.

When the Meteorological Department comes to write up its digest of the weather during January it may be expected to show a much-below-average temperature for that month, and a quite unusual record in the shortness of the spells of heat that did occur. A good deal of sultry weather was experienced, with old light showers of rain, mostly confined to the coast, not at all like the extreme dry heat which ordinarily characterises January in Adelaide. During the latter few days heavy monsoonal rains in Northern Australia have been felt as far south as our northern pastoral country, but not sufficiently general there to do much good. The vigorous report that prospects were excellent for coming grape crops until the 21st, when a terrific hot wind, with a duststorm such as has not been experienced for twenty years, swept over the vine districts, scorching the exposed fruit and doing such damage that cannot be ascertained till picking time comes.

The very serious fall in value of metals, especially copper and lead, has, as expected, created a dulness in trade, but, as we write, an upward move in these, especially copper, gives some hope of a revival. City merchants probably feel this as acutely as do country traders, though primarily such places as Broken Hill and the numerous copper-mining towns are soonest affected. Operations at Tarcoola are being suspended in many directions, unfortunately, and the outlook at present is not at all encouraging.

In breadstuffs the European markets have shown considerable activity, but at moment are weak, with California offering at 29s. 6d. for 500lbs. c.i.f. United Kingdom, without finding buyers—a pretty sure indication that the winter in the Northern Hemisphere is not unfavorable to the wheat sown. Australian cargoes are not worth more than 29s. 3d. there for 480lbs., and buyers, it is said, are showing marked preference in favor of this season's Victorian samples. Throughout Australia brisk demand has continued during the month, shippers in this and the neighboring State being compelled to advance prices to fill charter, through the shortness of delivery owing to the lateness of the harvest. All f.a.q. samples realise very full prices, and growers have been able to obtain more than the equivalent also for second-grade. Wheat at Sydney just now is on a par with prices ruling in Adelaide, but Melbourne quotes about 1d. higher. A fair amount of trade in wheat and flour doing with South Africa, but there also the markets are slack. Flour locally has been in good demand, and considerable trade done both for present and future deliveries to bakers and for export to W.A. Millers' offal has been very active, and their stocks of bran and pollard are now quite exhausted; in fact, some difficulty is being experienced in filling orders. Good local trade has been doing in forage, feeding grains especially commanding attention, some heavy South African orders placed with Melbourne houses causing this market to improve, though still the value of oats here is lower than with our neighbors; buyers also keenly operating in malting barley. Fodder remains unchanged, but values are firm, though chaff deliveries to Africa and Sydney have been completed, and there is no export business going on at the moment.

A few small parcels of potatoes have been imported, but demand has been filled chiefly by Adelaide locals and from Mount Gambier. Values have fluctuated but little during the month. South-East crops of onions will turn out much lighter this season, but Victorians are said to be about up to average. Fair crops are being pulled in the Hills near Adelaide, but price advanced during the month about 10s. a ton.

Further local shortage in the production of butter, following closely on our last report, forced prices further up, but some shipments of Victorian coming on this market sent values again back a little, though not to any extent, as a sharp rise about that time was shown in Melbourne. From appearances, present quotations in Adelaide may be expected to maintain at least until the cooler season permits the making up of print butter out of bulk boxes by retailers; meanwhile, trade is chiefly confined to local prints. A steady upward tendency marked the course of trade in eggs, strong demand from eastern States, in addition to the usual West Australian trade, keeping values on the up grade. Quotations for cheese only show a slight advance on previous rates, but the market is very much better, local stocks again proving light. Demand for bacon has been greater than supply, so that some small importations are being made, but buyers show preference for local brands. Hams also very saleable at advancing rates. Honey in much better request, and values improving. Almonds have been dull, buyers awaiting new crop.

Up till mid-month the demand for poultry continued brisk for all sorts, with recent high rates maintaining, but values have since given way under the influence of the large numbers of poor conditioned birds being sent to market. There is always an opening for a quantity of poor poultry required by fatteners, but when supply is in considerable excess, as during the past couple of weeks, very low rates have to be accepted to obtain quittance. Prime quality in all sorts, however, continue to sell readily at good prices.

MARKET QUOTATIONS OF THE DAY.

Wheat.—Port Adelaide—Shipping parcels, f.a.q., 2s. 11d. to 3s., f.o.b.; farmers' lots, 2s. 9d. on trucks, per bushel of 60lbs.

Flour.—City brands, £7 5s.; country, £6 15s. to £7 per ton of 2,000lbs.

Bran and Pollard.—1½d. to 11d. per bushel of 20lbs.

Oats.—Local Algerian and dun, 2s. to 2s. 3d.; prime stout feeding white, 2s. 4d. to 2s. 9d. per bushel of 40lbs.

Barley.—Malting 3s. 9d. to 4s. 2d.; Cape, 1s. 9d. for smutty to 2s. 4d. for clean per bushel of 50lbs.

Chaff.—£3 to £3 5s. per ton of 2,240lbs., bags in, dumped, f.o.b., Port Adelaide.

Potatoes.—New locals, £3 15s. to £4; Victorian, £3 15s.; Mount Gambiers, £4 per 2,240lbs.

Onions.—Local Spanish, £3 5s. to £3 10s. per 2,240lbs.

Butter.—Creamery and factory prints, 1s. 1½d. to 1s. 3d.; private separator and best dairy, 11½d. to 1s. 0½d.; good store and collectors', 8½d. to 10d.

Cheese.—South Australian factory, 6½d. to 7½d.; New Zealand, 8½d. per pound.

Bacon.—Factory-cured sides, 8d. to 8½d.; farm lots, 6½d. to 7½d. per pound.

Hams.—South Australian factory, 9d. to 10d. per pound.

Eggs.—Loose, 8d.; in casks, f.o.b., 9½d. per dozen.

Lard.—In bladders, 6½d.; tins, 5d. per pound.

Honey.—2½d. for best extracted in 60lb. tins; beeswax, 1s. 1½d. per pound.

Almonds.—Softshells, 6d.; kernels, 1s. per pound.

Poultry.—In live poultry, good table roosters realised from 1s. 10d. to 2s. 4d. each; ordinary to fair hens and light cockerels, 1s. 3d. to 1s. 7d.; a few coops of small and light birds, 1s. to 1s. 2d.; ducks, 1s. to 1s. 6d. for ordinary to fair; light-conditioned to good geese, 2s. 6d. to 3s. 3d.; pigeons, 4½d.; turkeys, 6d. to 9½d. per pound live weight for poor to fit table-conditioned birds.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, flour, and forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese.

"TOPPING-OFF" PIGS FOR FIRM FLESH.—A correspondent of a contemporary describes a new method of "topping-off" pigs and making the flesh hard instead of flabby. About an hour after the animals have had their usual ration, whatever it may be, give each one a small quantity of dry meal of whatever kind is preferred. It is not to be mixed with any other substance, nor is it to be moistened in any way. The pigs eat it slowly, as they are compelled to do on account of its dryness, and will take a good half hour to get through a small portion. The effect of this dry ration, eaten by itself about an hour after the usual feed is to impart a firmness to the flesh which is difficult to obtain by any other method of feeding. The pigs appear also to enjoy the dry meal thoroughly.

CENTRAL AGRICULTURAL BUREAU.

MONDAY, JANUARY 20, 1902.

Present—Mr. F. E. H. W. Krichauff (Chairman), Sir Samuel Davenport, Messrs. W. C. Grasby, H. Kelly, J. Miller, M.P., R. Marshall, T. B. Robson, and Acting Secretary (W. L. Summers).

Rust-resistant Wheats.

In reply to a question Mr. MARSHALL said that after several years' experience he could confidently recommend the following rust-resistant varieties of wheat:—Karraff (early), Field Marshal (early mid-season), Marshall's No. 3, Silver King, Majestic, and Gallant (mid-season).

The CHAIRMAN read letter from Mr. H. A. Giles, of Mount Pleasant, reporting favorably on Gluyas' Early wheat, which was rust-resistant, yielded well, and was early. Mr. Miller had also grown this wheat, which he found matured in less time than Steinwedel.

Conferences.

The ACTING SECRETARY reported that the Annual Conference of Northern Branches would be held at Crystal Brook on February 12, and of the River Murray Branches at Mannum on February 25 and 26. The Far Northern Conference was abandoned for this year on account of the season.

Takeall.

Some discussion on "takeall" took place. Mr. MARSHALL said he had to abandon farming in the southern districts owing to losses from this trouble. Large patches in the crops would die right off in September when the warm weather set in. They generally found that where there had been a fire on the land there was no takeall in the next crop. He firmly believed that takeall was due to exhaustion of certain constituents. Since he had been using manures for his crop he had not been troubled with takeall. Early fallowing and manuring was the cure; dry fallowing resulted in takeall.

Native Clover.

The CHAIRMAN tabled specimen of clover from Arcoona, in the North-West pastoral country. It was forwarded to him by Mr. C. A. Ilirsh, of Hawker, who stated that it was growing over considerable areas. It should make a valuable fodder, as stock were very fond of it and fattened quickly. It was quite distinct from the ordinary native clover, having no burs, and grows on the claypans, round the cane-grass swamps, and on the stony tablelands. None of the members knew the plant.

Crimson Clover.

The CHAIRMAN reported that at Bugle Ranges his son had grown a splendid crop of crimson clover. He sowed the seed with barley, cut the barley for green feed, and the clover came on well afterwards, so that he got two crops in one season. This clover had never been grown in the district before, and the crop created a great deal of interest, especially when in full bloom.

Improvement of Wheats.

Mr. MARSHALL suggested that the time was opportune to call meeting of committee appointed to consider question of improvement of our wheats, and to confer with the corn trade section of the Chamber of Commerce. After

some discussion Mr. Marshall agreed to read a paper at the February meeting, explaining his ideas of the best means of accomplishing the desired end, after which the committee would consider the matter.

Currant Vines.

Mr. ROBSON tabled several bunches of grapes from Zante currant vines. Two were from vines growing on the same wall; the bunches were large and fully developed, the berries being large and containing seeds. It was a common occurrence to get in bunches of Zante currant a few large berries with seeds, or even small bunches of large berries. These bunches, however, weighed over 1lb., contained only one or two of the true Zante berries. One of the vines had been "rung," and the other not, but there was no difference in the fruit. Where, however, the fruit was true to type the ringing had had a marked effect, the bunches being larger and the berries much superior in size and appearance. Where one arm only of a vine had been rung the effect of the operation was very marked. A ring of bark not more than $\frac{1}{8}$ in. wide was removed right round the stem below the first branch; it healed over very rapidly and does not harm the vine. If the cut is made too wide the check is greater, there is little or no leaf growth, and the fruit does not ripen fully.

Codlin Moth.

Mr. ROBSON took exception to the manner in which the inspectors under the Vine, Fruit, and Vegetable Protection Act carried out their duties. He had taken every care to clean and bandage his trees, but the inspector had served him with a notice to scrape and clean them all. His neighbor, who had absolutely taken no action to comply with the regulations, was not bothered by the inspector.

Mr. GRASBY had similar cases brought under his notice. Growers who did nothing were left alone, but their neighbors who were taking every reasonable precaution were ordered to do more by the inspectors. If any action was to be taken the inspectors should treat all alike. [As the Chief Inspector of Fruit has control of the inspectors it would be better if specific complaints were made direct to him instead of making charges against officers who are not present to defend their actions.—GEN. SEC.] Mr. KELLY thought they should endeavor to get Mr. Quinn appointed as a member of the Central Bureau in order that he could give them information when necessary. It was resolved—"That the Hon. Minister of Agriculture be asked to appoint Mr. Quinn as a member of the Central Bureau."

Standard Sample of Wheat.

The Secretary to the Chamber of Commerce forwarded sample of f.a.q. wheat for harvest 1901-2 weighing 62lbs. to the imperial bushel. The sample was carefully examined by members, several of whom commented on its superiority in matter of freedom from bunt and weed seeds over the sample forwarded last season.

New Members.

The following gentlemen were approved as members of the undermentioned Branches:—Clare, Mr. C. Horsman; Ardrossan, Mr. D. Wilson; Kingston, Messrs. T. Pinkerton, sen., B. F. Clark, H. Fraser, and E. Goode; Penola, Mr. H. Richardson.

Reports by Branches.

The ACTING SECRETARY reported receipt since previous meeting of forty-five reports of Branch meetings.

REPORTS BY BRANCHES.

Mount Compass, December 14.

Present—Messrs. R. Peters (chair), W. Gowling, F. Slater, J. Jenkin, F. McKinlay, H. McKinlay, R. Cameron, E. C. Good, and A. J. Hancock (Hon Sec.).

TAKEALL.—There is not sufficient wheat grown in this district for the question to be of any importance to members, who are not acquainted with the ravages of takeall.

FORCING SEED POTATOES.—Mr. Good wished to know best way to force setts to shoot. Mr. Peters recommended putting the potatoes on the ground, covering with old bags or litter, and then with stable manure. Care must be exercised that there is not too much heat in the manure or it will rot the potatoes.

PARIS GREEN.—Mr. Slater wished to know what percentage of arsenic there should be in Blundell's Paris green. [About 44 per cent. to 48 per cent. —GEN. SEC.]

Port Germein, December 21.

Present—Messrs. G. Stone (chair), W. Mortess, C. O'Loughlin, H. Kingcome, J. K. Deer, E. G. Blesing, W. Head, D. Thomson, J. K. Gluyas, E. McHugh, and one visitor.

DOMESTIC ECONOMY.—Mr. E. G. Blesing read a paper on "Domestic Economy; or, Don't Carry all your Eggs in one Basket."

The following observations more particularly apply to my own district, being the result of impressions received whilst collecting statistics and census papers in April last. The district is not adapted for wheat-growing, although a few indulge in that pastime. The holdings range from 50 to 3,000 acres, the larger blocks taking in the top of Flinders Range, the smaller ones being especially surveyed for homestead or garden blocks. Now, in such a district one would naturally expect a variety of pursuits, such as gardening, bee-keeping, poultry and pig rearing, dairying, &c., but the majority of the blockers pay very little attention to anything beyond a daily or weekly wage. Most of the families number from five to ten persons, and among these there would be only two or three breadwinners, and when slack times come they are all idle, and poverty pinches, since all are dependent upon the wages earned. Some of them do not even keep a cow or pig, and very few own more than a dozen head of poultry, whilst fruit and vegetable gardens are conspicuous by their absence. Of course, since the advent of the rabbit pest all the gardens have to be wire-netted. Everyone will admit that a couple of cows and a little flock of poultry will save pounds during the year in butcher's meat, besides bringing in a few shillings to buy groceries, and vegetables of our own growing are cheaper than those we buy ever so cheaply. Besides, all the labor required for these can be done by the children and female portion of the household. Bee-keeping perhaps requires a little more knowledge and skill, but women are as capable and fit as men to attend to it, while it is about the most remunerative employment—although requiring a little capital to start with—if carried on in the latest and best principles. In my own case during last year cows, pigs, poultry, and bees have given a far better return than wheat-growing for the labor expended, and the greater portion of that was done by women. The tendency of our time is too much in the direction that women are not fit for any outdoor work; in fact in many families such work as milking, gardening, pig-feeding, attention to poultry, is exclusively done by men. What a contrast to forty years ago, when you might have seen all the family, irrespective of sex, busy in the harvest field, the girls frequently doing a better day's work than the boys, and all as healthy and happy as possible. Again, domestic economy used to be practised more as regards dress and diet, where formerly moleskin and wincey sufficed, tweed and muslin are now required; and in our diet there is no end of varieties in the pastry line, which very often requires liberal application of patent medicines to neutralise the effects. The present generation generally is too eager to imitate and follow the fashions, customs, and habits of the upper ten, or so-called aristocracy. Domestic economy will be all the more necessary now since federation is an accomplished fact, and we find we have to pay nearly double the taxes on all goods we buy, at the same time getting no better price for our own productions. To those of us addicted to the weed

there offers a splendid opportunity of killing the goose that lays the golden eggs, and at the same time economising and saving by abstaining altogether from the pipe. There are other forms of economy, or rather the want of it I have often noticed, such as sending cans of cream to the factory the hottest of days without wet bags over them, and in some cases without any covering whatever. I have also seen a fine and healthy looking patch of star thistle growing within 200yds. of a homestead, the destroying of which would only cost an hour's work, whereas next year it will take as many days.

Considerable discussion ensued, members generally supporting Mr. Blesing's contentions. Beekeeping cannot, however, be profitably carried on in the plains here. The raising of poultry should be a profitable undertaking for farmers. Members did not believe in stinting food, but were in sympathy with Mr. Blesing's claim for domestic economy.

Mr. Blesing tabled samples of peaches and apricots, which were considered very satisfactory.

Hawker, December 27.

Present - Messrs. H. M. Borgas (chair), R. Wardle, J. W. Schuppan, S. Irvine, C. W. Pampa, T. Laidlaw, Jas. Fisher, A. C. Hirsch, J. Smith (Hon. Sec.), and two visitors.

CLEANING WHEAT.—The paper read at previous meeting by the Hon. Secretary on this subject was discussed. Mr. Irvine endorsed all the contentions of the writer. The Hon. Secretary said the General Secretary asked for proof of the statement he had made that although the wheat buyers docked the farmer for wheat below the standard, this docked wheat was shipped to foreign countries and sold as f.a.q. wheat to the injury of our reputation. Mr. Smith did not think anyone with any knowledge of shipping would require any proof of this, as it was a well-known fact that wheat bought at top price, and wheat docked in price was all put into the same stack and shipped together.

The Chairman read a paper to the following effect on "Will it Pay to Clean Wheat Twice for Market":—

He had no doubt in his mind that it would, if only to get back the reputation our wheats formerly held in the foreign markets. We have to rely on our wheat as the mainstay of our living, and this question should, therefore, receive our best consideration. As farmers, we study how to improve our horses, cattle, pigs, &c., and to improve the yield of our wheat; but after doing this we often throw away our good work by carelessness in preparing the wheat for market. If the wheat was cleaned in the ordinary way and then run through again, nearly if not quite all of the small grains and whiteheads which now find their way to the market would be removed, and he was sure it would pay them in the long run to do this. Say a farmer has 1,000 bags of wheat, which at 2s. 6d. per bush. would bring in £500. After selling this he has to purchase bran and pollard for his horses, as well as some for his pigs. If he has ten or twelve horses, and half a dozen pigs for fattening, he will require at least $6\frac{1}{2}$ tons of bran and pollard, which at present prices would cost £22 18s. 4d., leaving the farmer £477 1s. 8d. Had he run this wheat a second time through the machine he would have removed fifty bags of screenings at a cost of £4 3s. 4d., or 1d. per bag of wheat. These screenings would, as feed, more than replace the bran and pollard, and be better feed for stock. The farmer would have 950 bags to sell, and would get for them £475, against which must be set the cost of cleaning, giving a net return of £8 5s. less than on the first transaction; but to leave the contents of the fifty bags of screenings in the wheat would not make it a good sample, and the farmer would run considerable risk of being docked, as if the sample does not weigh 63lbs. to the bushel the buyer docks 1d. per bushel for every pound under that weight. If we take it that the extra cleaning secures an extra 1d. a bushel we have a profit of £10 8s., besides saving fifty bags of feed. Not only so, but the quality of our wheat would be so improved that it is not at all improbable that it would realise 4d. per bushel more in the home market, which would mean another £8 6s. 8d. to the farmer. He thought that wheat was cleaned better twenty years ago than now, and that our cleaning machines could be greatly improved.

RUSSIAN THISTLE.—Mr. Hirsch called attention to statement by General Secretary that the Russian thistle and buckbush were nearly identical. He considered such a statement very misleading. Every member of the Branch knew of the value of buckbush, and if the General Secretary would take the

trouble to inquire about the Russian thistle he would find it was nothing like our buckbush. [The General Secretary has probably had better opportunities than most members of the Bureau of inquiring as to the Russian thistle. He has numerous official reports, with illustrations, from America, where the plant was reported so troublesome, and he really prefers to accept the statement of the best botanical authorities that our buckbush is *Salsola kali* and the Russian thistle a variety of the same (known as *Salsola kali*, variety *tragus*) than any statement of Mr. Hirsch's that the two plants have nothing in common. It may interest Mr. Hirsch to know that the so-called Russian thistle is not a thistle at all, nor in any way allied to the thistles. It belongs to the same order of plants as our saltbushes, and its common English name is saltwort.—GEN. SEC.]

MANURES.—The Chairman stated that he was convinced that it would pay to use commercial fertilisers in this district, if they only got sufficient rain to make the wheat plant grow.

CROWS.—Mr. Hirsch again directed attention to the damage done by crows to lambs, chickens, and even wheat. If wheat is left in bags in the paddock for a single day after the cleaning the crows will make a hole in the bag and waste a lot of grain. He had noticed the General Secretary praised up the crow, but he was sure that if he only made himself acquainted with the mischief they did he would have to admit that it far outweighed the good he spoke so much of. The sooner an effective means of destroying the crows was found the better it would be for them all.

Clare, December 12.

Present—Messrs. W. Kelly (chair), J. Christison, C. J. McCarthy, R. S. F. Martin, A. P. Birks, and W. S. Birks (Hon. Sec.).

SUMMER PRUNING.—Discussion on this subject took place. Mr. McCarthy said he had a good deal of experience in the summer pruning of apples and pears, and his opinions were: (1) By adopting this method the trees could be thinned out to allow of better circulation of light and air, as many varieties are so dense in foliage that the fruit in the centre is too shaded; (2) a lot of useless wood can be got rid of, and by doing so vigor is given to the fruit-bearing wood that is left and the tree can also be shaped; (3) if summer pruning is carefully carried out the pruning in winter is greatly facilitated. Mr. McCarthy said he did not consider that summer pruning would hasten into bearing those varieties that are slow in cropping.

Port Elliot, December 21.

Present—Messrs. J. McLeod (chair), H. Green, sen., J. R. Coote, H. Gray, C. Gosden, and E. Hill (Hon. Sec.).

TAKEALL.—Members present had not sufficient experience with takeall to answer inquiries from Central Bureau.

PEAS.—This crop has in many cases been almost completely destroyed by caterpillars. In some cases the pods appear sound and full, but on being opened are found to contain nothing but a caterpillar; and this frequently when there was no sign of any entrance hole. Mr. Green recommended the Athletic pea for trial, being a strong grower; in a bush form it would keep off the ground better and be less difficult to harvest. [This pea sometimes grows 7ft. or more in height.—GEN. SEC.]

Saddleworth, December 13.

Present—Messrs. J. H. Frost (chair), W. H. Bee, Geo. Benger, J. H. Eckermann, D. H. Adams, F. Plant, and T. H. Neill.

HARVESTING WHEAT.—Mr. Benger read the following paper on this subject :—

The great importance of this work is evident when we consider that no expense has been spared in putting in the crop, in working the land, providing machinery, drills, manure, &c. It is not the quickest, but the way to get the best return from our crops to repay us for our outlay that we want. With the introduction of the binder some farmers tried binding their wheat and threshing it with the header, but found the straw would have to be chaffed: they tried mixing it with hay, and it made fairly good feed for horses, but not for cattle or sheep. This is not what we want. We want the straw as it is, not chaffed, for our cattle, who do not readily eat headed straw: it is too stiff, and the straw wants crushing so as to make it soft. Before the stripper came into use the wheat was reaped with the sickle, carted to the stack-yard, and threshed at first with the flail or trod out with bullocks, &c.: then the threshing machine came into use. In every case the straw was crushed and soft, and made good fodder for cattle. The bullocks that did all the work at that time were fed on this straw, and did well on it. This is what we want to-day, not the headed, but the threshed straw. Among the advantages over the stripper harvested wheat we would have:—First, a gain in time; could commence nine days to twelve days before it is fit for the stripper, thus saving it from the risk of rough winds, which often shake out 2bush. or 3bush. per acre. Next, we would have all the straw, with any oats that may be in the crop, all carted home, threshed, and stacked up for feed for our cattle or sheep for the autumn and winter months, when feed is so scarce. I do not advocate cutting all the crop, but the oats, barley, and one-third, or perhaps one-half, our wheat; say, cut with the binder till the wheat is too ripe, then finish with stripper. We thus save feed for cattle and sheep. Instead of having a stack of hay only to go to for everything, we should have stacks of oat, wheat, and barley straw, beside the chaff. Cattle and sheep will be more plentiful, and farmers prosperous and happy.

The majority of the members appeared to favor the views of the writer of the paper, but the Chairman opposed, as the cost of the threshing machine was too great, and in his opinion they would get 1½bush. per acre more where the stripper is used.

SELECTION OF SEED WHEAT.—The discussion on this subject was continued. Mr. Eckermann mentioned that Marshall's No. 3 and Majestic wheats were comparatively free from rust, while Purple Straw and Dart's Imperial were very liable to the disease.

EAR-COCKLE.—Mr. Neill tabled samples of ear-cockle in wheat heads; he noticed the plants were short and curly, and on examination found them affected by cockle.

Mount Gambier, December 14.

Present—Messrs. W. Mitchell (chair), D. Norman, sen., W. Barrows, J. C. Ruwoldt, D. Norman, jun., T. H. Williams, J. Kennedy, M. C. Wilson, T. Edwards, J. Watson, and E. Lewis (Hon. Sec.).

TAKEALL.—Some discussion on this subject, but members came to the conclusion that there was no takeall in this district. Wheat sometimes dies off, but there are mostly weeds left, whereas with proper takeall everything appears to die in the affected patches.

GREEN MANURES.—Members had not much experience in green manures. Mr. Ruwoldt had ploughed in mustard with good effect, while Mr. Barrows had tried ploughing in peas before a potato crop.

OATS FOR HAY AND GRAIN.—Several matters in connection with the cultivation of oats were discussed, a number of questions being submitted for answer. The first was "The best stage to cut oats for hay and for grain." Mr. Norman, jun., thought oats should be allowed to ripen thoroughly if they are to be cut for hay, with which the majority of members agreed. Mr. Kennedy thought they should allow Algerian oats to become fairly ripe for

hay before cutting. Green hay was bitter. Mr. Norman, jun., agreed, but stated that Mr. B. Davis preferred to cut them green for his horses. Mr. Norman used to cut oats on the green side for grain, thinking to get both the straw and the grain, but he found it did not do. Members preferred to cut Algerian oats for hay when they had turned, but other oats they would cut green. The question of the best varieties to grow at Mount Gambier was also discussed. It was generally agreed that Algerian oats were most profitable for grain, and also for hay, but where Calcutta oats would do they were the best for hay. Mr. Norman said there were several kinds of Algerian oats. The best time to sow was also discussed. Mr. Barrows thought the best way was to sow before the rain, and feed it down. The Chairman could not do this on his land, it would compact it too much. Mr. Norman, jun., thought feeding down depended upon the season; some years it was advisable, others not. On the poor land where he was he would plant oats in May, but near the Mount he would not sow until June or July. Other members agreed that oats should be sown as early as possible on poor land.

STOCK COMPLAINTS.—Stock Inspector Williams showed skull of cow affected by cancer in the eye, the bone round the eye being completely eaten away. Affected animals coming under his notice were killed and boiled down. He found that ovine ophthalmia was very prevalent this season. He advised the use of lotion made as follows:—6ozs. glycerine, $\frac{1}{2}$ oz. carbolic acid, and $\frac{1}{2}$ oz. of opium. Apply this with a feather. One application as a rule was enough, and the sheep recovered quickly without losing condition to any extent. Impaction in cattle was again causing losses. It was very bad in the Alledale and Mount McIntyre districts last year. The grass on much of the country contained very little nourishment. If people gave their stock hay with plenty of molasses in it it would have a good effect. The use of super. or bonedust on grass land was suggested as likely to improve the feeding quality of the grass. It was reported by several members that the botfly was very troublesome in the Mil Lel district, also at O.B. Flat, and elsewhere round Mount Gambier.

Saddleworth, January 10.

Present: Messrs. J. H. Frost (chair), W. H. Bee, G. Bengier, J. P. Daley, J. Eckermann, W. Hannaford, R. Townsend, F. Waddy, F. Coleman (Hon. Sec.), and one visitor.

SELECTION OF SEED WHEAT.—As an early wheat, for either hay or grain, Neumann's was recommended by Mr. Eckermann, but Mr. R. Townsend could not support him. The wheats best approved in this district for grain are Purple Straw, Dart's Imperial, and Marshall's No. 3.

TAKEALL.—Members considered the conditions favorable for takeall were a dry, open, lumpy seed bed, resulting from late fallowing of heavy land or very early fallowing of light land, that it is checked by a good spring rainfall, and by rolling; manuring, it was thought, would tend to check it.

CLEANING OF WHEAT. This Branch favors thorough cleaning of wheat for market. Mr. Bengier wished wheatbuyers would buy by sample, and so encourage the farmers to clean their wheat well and maintain our good name. Mr. Bee pointed out the difficulty of buyers for export giving higher prices for only a small portion of a parcel, the balance being only "fair average quality." Mr. Townsend suggested that the Farmers' Union export a cargo of well-cleaned wheat, from, say, 100 of their members, as an experiment.

WHEAT EXPERIMENTS.—Mr. J. P. Daley tabled samples of Marshall's No. 3 wheat, grown by him this season, yielding six bags to the acre; the wheat weighed 64½lbs. to the bushel. This wheat has yielded remarkably

well this season wherever tried ; it is almost free from rust. The Hon. Secretary showed specimens of twenty varieties of wheat grown on his farm, and gave the following particulars as to height, yield, liability to take red rust, &c. These wheats were sown in drills 14in. apart with plants 7in. apart in the drill. The land was manured with bone super. at rate of 1cwt. per acre, and seed sown on May 11 at rate of 7½ lbs. per acre. The hot winds seriously affected the yields from the later wheats. The following are the returns obtained :—

Experimental Wheat Plots.

Wheat.	Height.	Heads on Best Plant.	Red Rust	Weight Straw and Grain per Acre.	Grain per Acre.	Lbs. per Bush.	Remarks.
	Ft. In.		%	Lbs.	Bush. Lbs.		
Federation	3 10	23	7	6,500	30 12	61½	Early
Bobs	4 2	20	10	6,500	28 30	6½	Resists rust
Marshall's No. 3	4 0	13	1	5,375	27 34	—	"
White Lammas	4 7	30	6	9,330	23 49	—	Little rust, late
Wessex	4 4	29	5	7,125	22 33	—	"
Plover	4 3	18	½	5,000	21 1	63½	Resists rust
Field Marshall	4 5	18	½	5,375	20 26	—	"
White Essex	4 7	32	12	7,012	18 21	62	Rusty
Jonathan	4 6	24	5	4,012	17 42	—	Little rust
Schneider	3 9	15	2	4,375	17 42	—	"
Nonpareil	4 1	22	3	5,500	16 55	—	"
King's Early	3 9	19	7	5,624	16 24	—	"
Dart's Imperial	4 4	22	20	7,500	15 21	—	Very rusty
Outpost	4 2	18	20	5,012	15 21	—	" early
Zealand	4 2	21	10	4,750	13 55	—	Rusty
White Tuscan	4 5	22	10	6,624	13 32	—	"
Aust. Talavera	4 3	18	10	5,333	13 32	—	"
Purple Straw	4 4	25	15	8,000	11 58	51½	"
Rattling Jack	3 7	14	25	6,624	11 50	—	Rust smothered
Battlefield	3 8	15	20	5,125	9 14	—	Very rusty
Galland's Hybrid	4 4	10	20	3,330	9 6	—	"
Allora Spring	4 6	10	9	1,620	5 4	—	Rusty, early

In the above table the extent of red rust is based on Dr. Cobb's scale of rust on flag and sheath principally, 1 per cent. being "very slightly" rusted and 25 per cent. "exceedingly" or "rotten with rust."

Samples of French hybrid wheats were presented by Mr. Bec for experimental growth next season.

Wilson, December 21.

Present—Messrs. W. H. Neal (chair), A. Need, R. Rowe, H. Ward, J. Nelson, J. Coombe, T. Barnes, W. H. Neal, jun., A. Smith (Hon. Sec.), and one visitor.

SUGGESTIONS FOR IMPROVING THE BUREAU.—Mr. Grasby's paper on this subject was discussed. Members did not favor proposed reorganisation of the Central Bureau. A motion against any increase in the membership of branches was lost, an amendment that the membership be increased to twenty being carried.

CATTLE.—Discussion took place on best all-round cow for this district. Mr. Barnes favored the Shorthorns and Herefords. The Chairman agreed, as he considered the Jerseys too delicate for these parts. Feed being such an important item in this connection, and it often being necessary for them to sell their stock, they found the larger class of cattle most valuable for butchers. Members generally agreed with this view.

Norton's Summit, December 28.

Present Messrs. J. Jennings (chair), A. Smith, C. W. Giles, J. J. Bishop, W. H. Osborne (Hon. Sec.), and one visitor.

VISIT TO TYPICAL ORCHARD.—Members noted with pleasure statement of Hon. Minister of Agriculture that he would arrange for an annual visit of fruitgrowers to the Typical Orchard in March.

IMPROVING USEFULNESS OF THE BUREAU.—Mr. Grasby's paper on this subject was discussed. This Branch is strongly opposed to proposed nominee system in connection with Central Bureau, and consider Mr. Grasby's proposals would be improved in their most important particular by having elective members. Other portions of proposals found favor with members.

VEGETATION DISEASES ACT.—Members were pleased that amending Bill had been withdrawn, and trust that it will not be reintroduced unless in a more reasonable form

Pyap, December 18.

Present—Messrs E. Robinson (chair), A. J. Brocklehurst, W. Axon, J. H. McHugh, H. Mills, A. Westbrook, Geo. Napier, jun., J. F. Bankhead, J. Napier, W. C. Rodgers, and B. T. H. Cox (Hon. Sec.).

STANDARD BUSHEL.—Mr. Brocklehurst described the method by which the f.a.q. sample (otherwise the standard bushel) of our wheats was determined each year by the Chamber of Commerce. It was decided to discuss the matter at next meeting.

APRICOT BUDS.—Mr. Brocklehurst referred to Mr. Quinn's statement in report of November meeting (page 507 of *December Journal*) that it was impossible that the flower buds of the apricots after blossoming should have changed to wood buds, and said he thought the matter deserved fuller investigation by Mr. Quinn, who had passed the matter over too lightly. Mr. Brocklehurst said he was perfectly correct in his statement that the flower buds had changed to wood buds: he was not referring to the base buds at all. Others besides himself had seen the affected trees.

CROWS.—These birds have been very destructive in the apricot orchards, many bushels of fruit having been destroyed. Some members suggested that, as a noted authority had said, there were only a few crows in this State, the blame should be laid on the raven.

BLACK RUST.—Mr. Westbrook reported having found odd plants in the wheat crop affected by black rust. The whole plant was black, and only grew to half the height of the healthy plants alongside, and but few heads matured properly.

Lucindale, December 21.

Present—Messrs. S. Tavender (chair), E. Hall, A. Carmichael, A. Matheson, W. Dow, H. Langberg, G. C. Newman, E. E. Dutton (Hon. Sec.), and one visitor.

PEAR SCAB.—Mr. Dow showed pear leaf affected by the scab fungus.

RED RUST.—Mr. Langberg said his King's Early wheat was badly affected by rust, but Sullivan's Early was quite free.

WATTLES.—Mr. Newman tabled sample of wattle bark from a tree 3ft. to 4ft. in girth, growing on the white sandy fern land, the bark averaging $\frac{1}{4}$ in. in thickness.

CROPS.—Mr. W. Dow reported that he was getting nine bags of oats per acre from land manured with bonedust. Parrots were reported to be numerous and very destructive. It is stated that this season it has been a not uncommon occurrence to find seven young parrots in a single nest.

DAIRYING.—Mr. Langberg reported curious operation performed on a cow. She seemed quite paralysed in the hind feet, and could not rise. The feet were removed at the fetlock and appeared quite dead, not bleeding when removed. The cow was able to get about now. Mr. Langberg reported that he had five nice calves by the Holstein bull Friesland. One was black, two red and white, and three red, and he considered them an improvement on the breed he kept.

SEAWEED AS A MANURE.—Mr. Carmichael reported that he put 8 tons of seaweed on two acres of ground, but the crop following was not good; still he intended trying it on new land. It was rather costly, but he believed it would pay to use here.

Golden Grove, November 27.

Present—Messrs. R. Smith (chair), S. A. Milne, J. Ross, J. Woodhead, J. Rawlins, T. G. McPharlin, J. R. Smart, J. McEwen, and J. R. Coles (Hon. Sec.).

SUGGESTIONS FOR IMPROVING THE BUREAU.—The Chairman reported on proceedings of recent conference at Gumeracha, and the Hon. Secretary read paper prepared by the General Secretary on "An Old Idea in a New Form."

Brinkworth, November 22.

Present—Messrs. A. L. McEwin (chair), S. Aunger, A. W. Morrison, C. Ottens, W. H. Pearce, A. Horne, J. Stott (Hon. Sec.), and two visitors.

FOREST PLANTING AND TIMBER SUPPLY. Mr. A. L. McEwin read the following paper on this subject:—

In the November issue of the *Journal of Agriculture* Mr. F. Krichauff, Chairman of the Central Bureau, writes on this subject, and asks, "Is South Australia doing her duty to posterity?" As he has referred to paper read by myself on "Do Trees Attract Rain?" I feel that I cannot let it pass without a few comments. In the first case he asks where I got my information as to price of firewood in Adelaide thirty years ago compared with current prices. Reference to the advertisements of the day or inquiry at any of the old-established wood merchants will show that thirty years ago the wholesale price for gum was 11s. to 16s. per ton; to-day the price is from 10s. to 13s. per ton. Then Mr. Krichauff criticises the statement of some members of Caltowie branch that timber is cheaper to-day than twenty-five years ago. He throws doubt on the statement of men who probably know well what they are talking about. He says that this cheaper timber is certainly not grown in this State. Now as far back as I can remember my father sold gum posts on the Salisbury and Smithfield plains—red or good blue gum—at £5 per 100. They were not split to any particular size, but simply good handy size posts. Persons giving that price to-day would stipulate for particular sizes, and for posts cut from old timber. With reference to statement that the timber supply of the South-East had been doubled, I was not quite correctly reported here. I stated that it could not be shown that the timber supply had diminished in the South-East, yet the rainfall in that locality had been less of late years than formerly, as has also been the experience in the northern district. I mentioned this as evidence of the fact that growing timber had no effect on the actual rainfall. I stated that where I was brought up the growing timber had practically doubled during the past thirty years, and Mr. Krichauff has only to drive through the hills about Golden Grove, also near Clare, and he will see that my statement that the growth of saplings is in many places so thick that you could scarcely ride through them is quite correct. Then with reference to the value of the tree-planting done by the Government, what are they doing? Planting merely ornamental trees. Does Mr. Krichauff consider this wise? He speaks glowingly of the plantation at Redhill. It is, as from an ornamental point of view, a beautiful plantation, but is it any proof of the wisdom of the Government? (Of what practical use is the sugargum? It will not make good posts, and there is a great

probability of the gums meeting with the same fate as the miles of dead trees in the South-East referred to by Mr. Krichauff. Almost every farmer who has settled in this locality has planted sugargums about the homesteads with more or less success. It is a pleasure to drive through Mr. Angus's plantations on the Hill River property. There were also the large plantations of trees round Mr. Fisher's property at Crystal Brook, planted before Mr. Angus set out his trees. But does anyone ever expect these trees to make for commercial purposes? Present appearances do not point to such being likely. I note that here and there there are always a few trees dying and being removed to prevent them becoming unsightly. Again I would say there is no tree grown in South Australia that is used extensively as timber. The redgum is the most prominent, but the imported jarrah takes its place. South Australia is not mountainous enough and the rainfall is not sufficient to enable the right kinds of timber to be grown here. The gum is the only timber we have that is worth speaking about, and if the Government wish to preserve this it would be better to plant it in the districts where it grows naturally, and to buy land already timbered, and conserve the natural forests. This would be economy, and at the same time would bring in revenue.

Lipson, December 21.

Present—Messrs. Geo. Provis (chair), S. F. Potter, Chas. Provis, E. Thorpe, H. Brougham, Jas. McCallum, E. J. Barraud (Hon. Sec.), and three visitors.

POTATOES.—The Chairman tabled splendid sample of Beauty of Hebron potatoes.

MANURES FOR WHEAT.—Mr. C. Provis reported that from an experiment he had carried out he was convinced that had he used 1 cwt. of super. per acre instead of only $\frac{1}{2}$ cwt. per acre he would have reaped fully a bag of wheat per acre more than he did, and would also have been able to commence reaping a week earlier.

CATTLE DISEASE.—Mr. Brougham called attention to disease prevalent amongst cattle in this district, and which has caused the death of a large number. The animals first become dull, lose their appetite, and are very constipated. Later on they lose the use of their legs, and succumb in five or six days. The stomach in some cases becomes somewhat distended, but in others the beasts get very hollow. Some of the affected cattle seem to be constantly trying to chew the cud, but others have no desire to do so. Several cases have occurred in young heifers shortly after calving. [Symptoms point to impaction or acute indigestion, caused by unsuitable food. The treatment so frequently recommended in the *Journal* for this complaint should be tried.—GEN. SEC.]

TAKEALL.—Discussion on this subject took place. It was generally agreed that the trouble was worse in dry seasons, and that rain in the spring increases. Loose soil is most subject to the disease, and it is worse where the land is ploughed dry. It seems usually to make its appearance with the fourth crop on new land. Steinwedel wheat seems more liable than other kinds.

Pine Forest, November 24.

Present—Messrs. J. Phillis (chair), A. Mudge, G. Inkster, F. Masters, and R. Barr, jun. (Hon. Sec.).

WHEAT HARVEST.—Members estimated the wheat yield for the district, within a radius of eight miles from Bews post office, at 7 bush. per acre.

COST OF WHEAT-GROWING.—Mr. F. Masters read the following paper on this subject:—

Farm should consist of 1,200 acres, costing in the district £600. Four hundred acres of fallow and 100 acres of stubble land to be cropped each year; the crop on latter to be cut for hay for feeding stock on farm. I consider that fallowing and using artificial manures the only way to ensure a certain profitable crop, and, further, the land would always be in heart.

To properly work this holding the following implements, stock, &c., would be necessary:—Eleven horses, £165; six-furrow plough, £35; set of harrows, £6 10s.; drill, £36; binder, £40; two strippers, £94 10s.; winnower, £27; wagon, £40; dray, £14; buggy, £30; cultivator, £32; chaffcutter, corncrusher, and horseworks, £50; harness, chains, &c., £40. Total cost of working plant, £610. With the system mentioned above 8bush. per acre would be averaged with certainty.

Cr.	£	s.	d.	Dr.	£	s.	d.
By 800 bags wheat at 10s.	400	0	0	To Interest on land at 5 per cent.	30	0	0
				Water rates and taxes.....	20	0	0
				Interest on working plant ..	30	10	0
				300bush. seed wheat at 2s. 6d.	37	10	0
				Manure—80lbs. per acre, at			
				£5 per ton	70	0	0
				Labor	80	0	0
				Bags, twine, &c.	15	0	0
				Binder twine	7	10	0
				Blacksmith	10	0	0
				Saddler	5	0	0
				Depreciation on working			
				plant at 12½ per cent.	76	5	0
				Cost of producing crop ..	381	15	0
				Profit.....	18	5	0
Total value of crop	£400	0	0		£400	0	0

The profit made on crop would represent a very poor living for the wheatgrower, as every bushel of wheat produced has cost about 2s. 1d., and unless prices improve or larger returns obtained from the soil insolvency is the result. The former is hardly likely, while the latter is possible. But that the profits go to the all-round farmer the balance-sheet herewith will show, as it can be carried out upon the same farm with an additional outlay as under:—100 ewes at 10s., £50; sheep-proofing, £26; four cows and one bull, £30; five pigs, £10; pig netting, £5; and 100 fowls, £6. Total outlay, £126.

Cr.	£	s.	d.	Dr.	£	s.	d.
By Seventy-five lambs at 7s. 6d.	28	12	6	To Interest on additional outlay	6	6	0
Wool	18	15	0	Depreciation on same	15	9	0
Butter	15	0	0	Shearing, woolpacks, &c. ...	3	10	0
Increase in pigs	36	0	0	Feeding poultry	5	0	0
“ fowls	10	0	0	Feeding pigs	12	0	0
Eggs	15	0	0				
				Total cost	42	5	0
				Profit.....	81	2	6
Total receipts	£123	7	6		£123	7	6

This profit on additional outlay added to the slight profit on wheat-growing constitutes a very fair living for the farmer together with the butter and eggs consumed in house and vegetables, &c., grown by himself. Thus the wheatgrower fails while the farmer keeps his head above water.

Wilmington, December 23.

Present—Messrs. W. Slee (in chair), J. Hannigan, J. W. Schuppan, T. Carter, J. Lauterbach, and R. G. S. Payne (Hon. Sec.).

SUGGESTIONS FOR IMPROVING BUREAU.—A lengthy discussion took place on Mr. Grasby's paper on this subject. Members were of opinion that one-fourth of the unofficial members of the Central Bureau should retire each year, but be eligible for reappointment; that there should be an increase in the maximum of membership of Branches; and that the scope of the work of the Branches be increased, as suggested by Mr. Grasby.

TAKEALL.—Members have little experience of this complaint. It has been noticed on heavy soils fallowed fairly early. It appears four or five years after first cropping. It has not been noticed on light soils. Members could not say what effect rolling or manuring would have.

Ardrossan, December 21.

Present—Messrs. C. Cane, S. Alderman, C. Dinham, R. Dinham, J. Cornish, J. Henderson, E. Bowman, and W. Lodge.

MEMBERSHIP.—It was decided that the names of all members absent for three consecutive meetings be struck off the roll, and the seats of three members were accordingly declared vacant.

TAKEALL.—Mr. Lodge found this disease worse in wet seasons, and it appeared to increase after spring rains. Loose light soil was most affected. Fallowing or manuring appeared to make no difference. Rolling has not been practised to prevent the trouble, which is worst on the banks of crab holes than elsewhere.

RED RUST.—Samples of wheat in the straw were tabled by several members. All were more or less affected by rust except Hawke's Early. It was decided that members bring samples of rust-resisting wheats to next meeting.

Inkerman, January 24.

Present—Messrs. W. Fraser (chair), W. Board, F. C. Smart, C. E. Daniel (Hon. Sec.), and one visitor.

TAKEALL.—Discussion on this subject took place. Members considered late fallowing the main cause of the trouble, although some members had seen it very bad on early-fallowed land. Mr. Board had all his fallow affected, while grass land ploughed and sown had no takeall. This was all light scrub lands. It was agreed that takeall increases after a good rain in spring, that rolling before sowing was beneficial, and that it made no difference if drilled and manured, while one variety of wheat was as liable as another.

Mundoorra, December 27.

Present—Messrs. W. Aitchison (chair), W. Mitchell, W. D. Tonkin, W. J. Shearer, C. Button, and A. E. Gardiner (Hon. Sec.).

CONFERENCE AT CRYSTAL BROOK.—It was decided that this Branch should send representatives to Conference of Northern Branches to be held at Crystal Brook about middle of February.

SEASON.—Members reported that harvesting operations were being pushed on, but the wheat would not be equal in quality to last year's. This was largely due to the effects of red rust and the hot dry winds experienced in the latter part of spring.

Forster, January 2.

Present—Messrs. J. Retallack (chair), W. Johns, J. Sears, F. Johns, J. Johns, J. Childs, A. Johns, E. Schenscher (Hon. Sec.), and one visitor.

DISEASE IN FERRETS.—A member inquired if any cure was known for ferrets which become stiff in the back, short of breath, and scour very much.

BEST WHEATS.—Members were of opinion that the three most suitable wheats for dry districts are Diamond Superior, Gravestock Frampton, and Purple Straw. The two former are early and drought-resisting. [What about liability to red rust?—GEN. SEC.]

TAKEALL.—Members' experience was that takeall was worse in wet seasons; that rain in spring did not affect it; that loose, light, friable soils were most subject to it; that early fallowed land was liable; that rolling has not prevented it; that no variety of wheat is more liable than another, and that crops of oats or peas or heavy dressings of stable manure will prevent the trouble. Mr. Sears thought it due mainly to improper cultivation.

Reeve's Plains, December 20.

Present—Messrs. W. H. George (chair), W. Day, H. Day, M. Richter, and J. McCord (Hon. Sec.).

SUGGESTIONS FOR IMPROVING THE BUREAU.—Mr. Grasby's paper on this subject was discussed. The Chairman thought that the more members the better, but anyone was at liberty to attend the Bureau meetings. If the membership was enlarged they could not expect to have the secretarial work performed for nothing. He thought it would be a very good idea for the Government to send the *Journal of Agriculture* to all farmers. Mr. H. Day favored an increase in the membership to twenty, and would encourage the attendance of young men. The Hon. Secretary opposed the increase in membership. He could not see anything in Mr. Grasby's proposal in this direction; the proposed executive would represent the members as at present, and the other members who would have no say in the management of the Branch would be no better than visitors. He thought the Central Bureau was like a good many Branches—it contained too many sleeping members. He would like to see country members elected to the Central Bureau and the Chairman appointed annually instead of having a permanent chairman, as at present. Mr. W. Day and Mr. Richter were against any increase in the membership of Branches. It was finally resolved that the Branch is in favor of the reorganisation of the Central Bureau and the election of the Chairman annually, but any increase in the membership of Branch is not desirable.

Eudunda, December 23.

Present—Messrs. J. von Bertouch (chair), F. W. Pacch, H. Martin, W. F. Krummel, F. H. Walter, J. A. Pfizner and W. H. Marshall (Hon. Sec.).

EXPERIMENTAL PLOT.—The Hon. Secretary reported that as the experimental block was under fallow, Mrs. A. Kluske placed at the disposal of the Branch for the past season's work a block of fallowed land containing thirty-four and a half acres. The land was early fallowed, and the ground thoroughly prepared. Each area received exactly the same treatment, being drilled with 40lbs. of seed to the acre, with manures at the rate of 50lbs. of superphosphates and 100lbs. of sheep and stable manure, the whole being thoroughly mixed and run through the drill. The method adopted with the sheep and stable manure was to collect it when fresh and cart it into a covered shed, where the two were thoroughly mixed. At seeding time it was sifted through a small sieve and mixed with the super. in the stated proportions, and it was found to run through the drill splendidly. Seed was sown May 27 and 28, and the plots reaped on November 20. The rainfall from June 1 to November 30 was 9½ in. No. 1 plot of Early Para, six acres, yielded fifteen bags, equal to 62½ bush., or 10 bush. 25lbs. to the acre. A portion of this plot was of limestone ground, and showed a considerable falling off from plot No. 2 of Early Para, of nine acres, the yield of which was thirty-two bags or 133 bush., equal to a little over 14 bush. to the acre. No. 3 plot, of eight acres of Smart's, gave 15 bags, or 63½ bush., or almost 8 bush. to the acre. No. 4 plot, of King's Early, eleven and a half acres, gave a return of thirty-four bags, or 140 bush., or 11 bush. to the acre. From the thirty-four and a half acres there was a total yield of over 340 bush., an average of 10 bush. to the acre, which, taking the season into consideration, is regarded as very satisfactory. A small plot of Bluey, which suffered much from smut, averaged 10 bush., whilst Ranjit and Majestic, two new varieties, this being the second year only of testing them, have not proved at all satisfactory. A small sample of Theis

wheat, which Mr. Krichauff obtained from Germany, proved a complete failure. Only one or two grains germinated, and they did not come to maturity. Mr. A. Kluske, who carried out the work for the Branch, was thanked for his services and the Hon. Secretary was thanked for the report. Samples of the different wheats, both in straw and ready for market, were exhibited and were much admired. The wheats averaged in bulk from 65lbs. to 66lbs. per bushel. The cost to the Branch of the experimental work carried on since the small grant made by the Government was withdrawn has been £35 10s. [Well done, Eudunda! How many Branches can show a better record?—GEN. SEC.]

TAKEALL.—Members were generally agreed that this was caused by an insect, and that it was worst in loose soils and in wet seasons. They promised to jot down their observations on the trouble for future reference.

PICKLING WHEAT.—Members wish to know if it would injure seed wheat to pickle it a month before seeding, or if the good effect of the pickle would be lost. [If care is taken to thoroughly dry the seed before rebagging and the bags are pickled first to destroy any bunt spores, no harm should result to the seed and the pickling should be just as efficient. I know some of our members carry out this practice. Will they please report their experiences?—GEN. SEC.] One member stated he made it a practice of carrying over portion of his seed wheat from one season to another, and it answered well.

MATING POULTRY.—A member wished to know how long after mating a pair of young fowls would it be before the eggs could be used safely for setting.

Boothby, January 2.

Present—Messrs. J. T. Whyte (chair), J. A. Foulds, T. Sims, D. Sims, H. Robinson, G. T. Way, J. R. Way, J. Bell, R. Carn, M. Leonard (Hon. Sec.), and four visitors.

PREVENTION OF GRASS FIRES.—Mr. G. T. Way said he had proved that dragging logs over the grass when it is quite brittle makes a better fire-break than is served by ploughing. The fine dust that is raised seems to settle on the grass and smother fires even before they reach the portion that has been crushed down. Mr. Robinson favored ploughing strips one chain apart and burning the space between. Mr. Way said there is danger in that method, because the strips cannot be burned until the grass is dry, and sparks would readily ignite the adjacent paddock.

TREE ONIONS.—A visitor tabled some fine tree onions, one weighing 2½lbs. taken from a plot 27ft. x 33ft., which yielded five wheat bags full of onions. The original seed was obtained from the Bureau, and this plot was not irrigated, but was fertilised with superphosphate. Transplanting was beneficial to this crop.

Kingston, January 4.

Present—Messrs. W. W. Pinches (chair), T. Redman, T. A. McCulloch, W. Bassett, and F. S. Wight (Hon. Sec.).

INFERTILE STRAWBERRIES.—Plants of strawberries put in on red sandy loam, with clay subsoil at 2ft. depth, in June last made vigorous growth, with strong runners, but produced neither flowers nor fruit. Why? [If the setts were procured from very old plants such a result would be probable. Some varieties of strawberries do not appear to bear fruit satisfactorily in the South-East. The Hautbois kinds seem to thrive better than others in that part of the State.—GEN. SEC.]

Renmark, December 26.

Present—Messrs. E. Taylor (chair), C. R. Rose, F. Cole, W. H. Waters, F. Turner, H. H. Swiney, and J. A. Forde (Hon. Sec.).

ANNUAL REPORT.—Hon. Secretary reported seven meetings holden during the past year, with the low average attendance of four and a half members. Six papers had been read, of which four had been contributed by himself and one by a visitor.

OFFICERS.—The Chairman was re-elected. Mr. Fred. Cole was elected Hon. Secretary. Officers were thanked for their past services.

BUSINESS.—Chairman remarked severely upon the want of interest evidenced by some members in failing to attend meetings. Members decided to do better in future, and five papers were promised for the next five meetings.

Kanmantoo, December 19.

Present—Messrs. J. Downing (chair), W. G. Mills, A. D. Hair, F. Hair, and F. Lehmann (Hon. Sec.).

RUST-RESISTANT WHEATS.—Messrs. Hair showed several samples of grain. Ranjit was largest and plumpest; Majestic and Majestic Special were both good. None of these were much affected by rust, but Ranjit was weak in the straw and hard to thrash. Mr. Mills showed fine sample of Gamma wheat, with long heads. The Hon. Secretary showed World's Champion badly rusted, in fact the worst of any he had grown. Silver King was the least affected, and was a good yielder. Ranjit came next. White Tuscan had also withstood the rust well; but Purple Straw was badly shrivelled. Members had noticed that thin sown crops were least affected, and the thick rank crops the worst. Mr. Hair said he had never had a late-sown crop yield so well as his early crops. He had seen a crop of wheat badly rusted, while Cape Oats alongside were quite free. Mr. Mills said he had sown two lots of Steinwedel wheat with an interval of two weeks, the earlier being least affected by rust, and giving better returns than the later crop. He had, however, got 40bush. per acre from oats sown in July, though the straw was short. If sown early there was too much straw in proportion to the grain. Some members preferred sowing barley early, others late. Messrs. Hair said they had sown Early Para wheat very thickly, and got 26bush. per acre. Last season they sowed later and thinner, and the crop went down a lot.

Mount Compass, January 11.

Present—Messrs. M. Jacobs (chair), W. Gowling, F. Slater, R. Cameron, R. Peters, C. S. Hancock, A. J. Hancock (Hon. Sec.), and one visitor.

SUGGESTIONS FOR IMPROVING BUREAU.—Paper read by Mr. Grasby at Congress was discussed. Mr. Gowling favored the reconstruction of the Central Bureau, and thought the chairman should be elected annually. The limit of membership should be the same for Central Bureau as for the Branches. He did not favor so many official members. Mr. Cameron thought the Chamber of Commerce should be represented on the Bureau, that the gardening interests should be better represented, and that some younger men should be appointed. The Chairman agreed, and thought there was need for men of more practical experience than some at present on the Central Bureau. It was resolved that in the opinion of this Branch the "drones" should be weeded out and that the Central Bureau should consist of nine nominated and six elective members.

Penola, January 11.

Present—Messrs. W. Miller (chair), L. R. Peake, H. Ricketts, H. Richardson, S. B. Worthington, J. D. Wilson, D. McKay, T. H. Morris, E. A. Stoney, R. Fowler, and F. Ockley (Hon. Sec.).

SOUTH-EASTERN BRANCHES.—It was decided to suggest to Millicent Branch that the Annual Conference be held at Millicent early in March.

RABBITS.—Discussion took place on most efficient means of destroying rabbits. Mr. McKay described method of destroying them in the burrows by means of cartridges charged with sulphur. The cartridges were made by soaking thick unglazed brown paper in a saturated solution of saltpetre, and when nearly dry spreading flower of sulphur thickly, then rolling to convenient thickness and securing. The roll was then divided into suitable lengths, lighted, and placed in the burrows. It was necessary, of course, to close up all the entrances except the one in which the cartridge is placed. The fumes from the burning sulphur destroyed all the rabbits in the burrows.

RUTHERGLEN FLY.—The Hon. Secretary reported damage by this pest. He had completely lost a promising crop of mustard of forty acres; the "grub" first attacked the plant, then the Rutherglen fly, and now the field looked like bare fallow.

PEACH APHIS.—Discussion took place on means of combating this pest, it being generally agreed that an application of kainit to the roots during winter was most effective.

Yorketown, January 11.

Present—Messrs. J. Koth (chair), C. Domaschensz, A. E. Anderson, A. Jung, C. H. Davey, Jno. Davey (Hon. Sec.), and one visitor.

TAKEALL.—Farmers are not much troubled with this here, and members have no information as to its behaviour.

RED RUST.—The Chairman tabled three samples of wheat, all fairly good. Petatz Surprise was best, Early Para next, and Purple Straw next. None were much affected by rust.

MANURE EXPERIMENTS.—The Chairman reported results of some experiments with manures. The plot without manure yielded 5bush. per acre; plot receiving 70lbs. super., 8bush.; and plot receiving 100lbs. super., 10½bush. The plots were sown with Early Para wheat, which went down badly, and a lot of grain was lost.

Ardrossan, January 18.

Present—Messrs. G. J. W. Freeman (chair), C. Cane, C. Dinham, E. Bowman, J. Hill, J. Henderson, W. Lodge, and N. Opie (Hon. Sec.).

PICKLING EGGS.—Mr Henderson wished to know proportion of lime and salt used for pickling eggs. [Salt is not absolutely necessary. Various strengths of pickle are used; but the following will be found very satisfactory. To the clear lime-water made by slaking 3lbs. fresh lime in 3galls. of water add 12ozs. salt and 1oz. cream of tartar.—GEN. SEC.].

TICK ON FOWLS.—Mr. Henderson asked what strength Cooper's sheep dip should be used for destroying tick on poultry. [Same as for dipping sheep. The head of the fowl must not be immersed.—GEN. SEC.].

RED RUST.—Members thought the average yield of wheat in this district would be from 5bush. to 6bush., the rust having reduced the returns by nearly

one-half. A sample of Petatz Surprise wheat was shown; it was early, free from rust, and returned 12bush. per acre, the sample weighing 68½lbs. per bush.

TAKEALL.—This is worse here in dry seasons, but no difference has been noticed when there has been good spring rains. Loose light land is affected, and both early and late fallow. Land affected had been manured with mineral super.; rolling in spring had no effect.

THRESHING MACHINERY.—The question of purchase of steam thresher and cleaner with straw press was discussed, and it was decided to obtain full particulars as to cost, &c.

Wilson, January 18.

Present—Messrs. W. H. Neal (chair), H. T. Crossman, H. Need, H. J. Nadebaum, W. H. Neal, jun., H. Ward, A. Smith (Hon. Sec.), and one visitor.

SHRIVELLED v. PLUMP SEED.—Discussion took place on different results obtained by sowing plump and pinched wheat. Mr. Need believed that the plump grain would give the best results when the season is not altogether favorable, but if the rainfall is early and good the pinched grain would yield equally as well. Mr. Ward agreed, but Mr. Crossman would not sow pinched grain unless compelled, as he believed that the plant from a plump grain was stronger and would stand lack of moisture better, besides giving a better return than shrivelled seed, even if the season was favorable. The Chairman wished to know whether by continually sowing small grain the sample would deteriorate, even if favored with good rainfall. Personally he thought it would, and Mr. Crossman held the same opinion. [There is sound truth in the statement that "like begets like," and I have no doubt that continued sowing of small seed, the product of small seed, would in time have an exceedingly bad effect on the sample.—GEN. SEC.]

Belair, January 17.

Present—Messrs. O. Nootnagel (chair), Jno. Halstead, W. J. Halstead, and G. R. Laffer (Hon. Sec.).

IMPROVING WORK OF BUREAU.—Some consideration was given to Mr. Grasby's paper, but owing to small attendance no decisions were arrived at.

BIRD PESTS.—Fruitgrowers complain of ravages of birds, which are unusually destructive this year. The Chairman attributed this to the scarcity of honey, with which members concurred, as they noticed that most of the native birds attacking the fruit were honey-eaters.

PEACHES.—The peach crop was reported to be good; where thinning has not been practised the fruit is mostly small.

Watervale, December 23.

Present—Messrs.—C. C. Sobels (chair), H. Beek, H. Scovell, G. Hunter, G. Holder, E. E. Sobels, S. Solly, B. Perrin, H. Ashton. E. Treloar (Hon. Sec.), and one visitor.

TAKEALL.—Mr. Ashton reported having had takeall very badly this year on loose black crab-hole and Bay of Biscay land. It was fallowed early, broadcasted seed, and no manure; land had been under crop for thirty years or more; land was rolled after sowing. It was considered advisable to change

crop to peas, oats, sorghum, or other plant. Members would like to know what takeall really was, and what was its effect on the crop. [There is no doubt that many different causes of wheat dying off are called "takeall." In many cases rootfall through absence of moisture and too loose seed bed is the cause.—GEN. SEC.]

MEMBERSHIP.—Members thought it advisable that the limit of membership should be increased to twenty.

BRANCH SHOWS.—It was decided to hold a fruit, flower, and produce show at an early date. Mr. Treloar tabled Mansfield Seedling apricots; fine and clean and of good quality, but a shy bearer.

Onetree Hill, January 17.

Present—Messrs. J. Bowman (chair), G. Bowman, W. Kelly, E. A. Kelly, A. Thomas, and J. Clucas (Hon. Sec.).

TAKEALL.—This is worse in dry seasons, and if present in the crop appears to spread with renewed vigor after spring rains. Lands most subject, loose and friable with limestone bottom. Late fallow by some members was thought to be more liable, especially if worked when dry. Newly-cultivated land is found to be just as liable where the disease exists as older ground. Manuring and drilling appear to have no effect. Early varieties of wheat are considered to be the most liable. It has been found that cropping with Cape oats has a tendency to destroy takeall and barley to promote it. One member did not think late ploughing alone rendered the crop more liable to takeall. He had known takeall to start on one side of a paddock adjoining grass land and to extend through the crop. In a previous year he had also noticed it commence on one side and spread into the crop.

WORK OF BRANCH.—This Branch contemplates inviting prominent men to address public meetings on agricultural matters, and besides paying visits to such places as will afford object lessons on stock-raising, improved methods of cultivation, &c.

Naracoorte, January 11.

Present—Messrs. S. Schinckel (chair), W. Hastings, G. Wardle, J. Wynes, J. G. Forster, F. Welcome, A. Caldwell, H. Smith, and A. Johnstone (Hon. Sec.).

SOUTH-EASTERN CONFERENCE.—It was decided that the Hon. Secretary read his paper on "Increasing the Scope of Usefulness of the Professor of Agriculture" at the Annual Conference to be held at Millicent.

TAKEALL.—Some discussion took place on this subject, but members agreed that they knew very little about it, as it was not prevalent in this district. Mr. Wynes thought the so-called takeall was often simply a result of bad cultivation.

INCREASING THE USEFULNESS OF THE BUREAU.—The Chairman agreed with many of Mr. Grasby's suggestions, but thought it rested with the members individually to make the meetings instructive. There was no doubt that the Bureau was doing good work, but there was a possibility of it outliving its usefulness unless the members bestirred themselves. He regretted young men did not take more interest in the Bureau work. All members agreed as to the disinclination of young men to go on to the land as workers, and to their preference for billets that did not necessitate hard manual work, or work that

would soil their hands. Some members hinted that the present system of education was the bottom of the trouble. It was resolved—"That this Branch is of opinion that some improvement is necessary in the organisation of the Bureau to make it more useful, and that reform can be brought about somewhat on the lines suggested by Mr. Grasby." Mr. Forster thought every one working the land should be connected with the Bureau. The Branches were apt to become exclusive and to forget that they existed for the general welfare. It was objected that the cost of supplying the *Journal of Agriculture* to the members would be excessive if there was any material increase in the membership, but Mr. Forster thought the Government should send the *Journal* to every cultivator of the soil. It would be money well spent and need not cost so very much.

EXPERIMENTS.—The Chairman said there was a resolution on their books that members should report twice a year on their experiments. He had tried Federation, Marshall's No. 3, Silver King, Marshall's Early Solid Straw, and Gallant wheat from Mr. R. Marshall. The latter was very good, but the others were inferior crops and dirty, but none showed any rust. He had also used Bally bonedust in varying quantities, from 100lbs. to 200lbs. per acre, but could see no difference in results. Marshall Hybrid wheat was a good yielder and he thought suitable for the district, but this year it was very rusty. Theis wheat was fairly good and free from rust. Hanna barley yielded five bags from a bushel of seed. Dart's Imperial wheat manured with 100lbs. super. yielded heavily, but was badly rusted. With the new kinds of potatoes the crops were not good. Thiele yielded 76cwts. per acre, Prof. Maercker 60cwts., and Ehler's 55½cwts. He had also tried a number of grasses, but, with the exception of Cocksfoot and Crested Dogstail, they were failures. Several members reported on tests of potatoes received from Mr. Schinckel; the crops were spoilt by second growth, due to late spring rains. Mr. Forster had grown Dart's Imperial and Purple Straw wheats; the former was free from rust, but the latter was rusted slightly on the flag.

Stansbury, January 4.

Present—Messrs. A. Anderson (chair), P. Anderson, J. Antonio, G. Jones, H. C. Pitt, and P. Cornish (Hon. Sec.).

SNAKES IN UNDERGROUND TANKS.—Mr. P. Anderson wished to know whether a snake could make a hole in a cemented wall. He had a tank which suddenly began to leak, and when empty he found a hole about 3in. from the bottom and a snake in the tank, which was about 18ft. deep. [Exceedingly doubtful if not impossible, even with a badly-constructed wall.—GEN. SEC.]

CROSS-BREEDING OF WHEATS.—The Chairman wished to know where instruction in cross-breeding of wheat was given.

RINGING CURRANT VINES.—Members inspected Mr. Pitt's orchard and vineyard, and were much pleased with what they saw. The currant vines came in for particular attention, various experiments in their treatment coming under notice. Those vines which were rung have a heavy crop; the berries are large, being superior in every way to the vines not treated. The apple trees were found in splendid condition and carrying a good crop; peaches and other stone fruits were bearing splendidly. Mr. Pitt gave the visitors much useful information concerning the different fruits grown, their treatment, &c., which was much appreciated, and a vote of thanks was accorded to Mr. Pitt for his kindness.

Cherry Gardens, January 14.

Present—Messrs. W. B. Burpee (chair), T. Jacobs, C. Lewis, J. Lewis, H. Strange, G. Brumby, E. Wright, T. Paltridge, and C. Ricks (Hon. Sec.).

TAKEALL.—Members wish to know which of the many forms of takeall the General Secretary referred to in report of Tatiara Branch does he wish them to discuss [The form of takeall with which members are familiar is the one they should discuss.—GEN. SEC.]

CODLIN MOTH PARASITE.—Mr. C. Lewis tabled mud nest of an insect, probably a wasp, taken from an apple tree, and found to contain several dead caterpillars, apparently codlin moth caterpillars.

BUNT.—A member wished to know whether wheaten hay affected by bunt was likely to be injurious to horses or cattle.

DESTROYING BRIARS.—Mr. Paltridge asked whether common salt put on the roots of briars after the branches have been grubbed would destroy the roots. [Very doubtful; if enough salt to kill the roots was applied it would probably have an injurious effect on the soil.—GEN. SEC.]

Caltowie, January 20.

Present—Messrs. N. Hewett (chair), L. Graham, G. Petatz, A. Kerr, L. Wenham, J. H. Both, A. McCallum, and F. Lehmann (Hon. Sec.).

MANURES FOR WHEAT.—A discussion on the use of manures in this district took place. Mr. Petatz would not advocate heavy manuring. This season his worst returns were from land receiving most manure. Mr. Graham said it would have paid him better not to have manured his land, as the wheat did not come up well. Mr. McCallum advocated heavy dressings. On the headlands which were gone over twice with both seed and manure the heads were equally as large, and the crop cleaner and better, than the rest of the paddock. He was satisfied that he got twice the crop that his neighbor's unmanured land produced, and was quite satisfied that in this district 1cwt. or more per acre could be applied with profit. He did not advocate sowing lumpy ground with the drill. Mr. Kerr noticed that where he used manure the heads were larger, the grain better, and the crop cleaner and less affected by rust, besides being earlier than the unmanured land. An experienced farmer had told him that it was much better to manure in dry weather, providing the land was clean. Mr. Hewett advocated manures in this district, but was against heavy dressings.

Balaklava, January 11.

Present—Messrs. P. Anderson (chair), G. Reid, C. L. Reuter, A. Manley, A. W. Robinson, J. Crawford, W. Tiller, A. Hillebrand, and E. M. Sage (Hon. Sec.).

TAKEALL.—None of the members have been troubled with takeall for several years, and it was considered that the present practice of fallowing early and cropping once in three years had practically got rid of the trouble. Mr. Robinson had a little takeall on a small piece of ground, and he attributed it to the fact that it was out of crop for only one year.

R&D RUST.—Discussion took place on this subject. The early sown, and particularly the early-maturing kinds, had suffered least. Nearly all the varieties that were late in ripening were affected, even King's Early, under these conditions. Mr. Robinson found Allora and Marshall's No. 3 practically free from rust; the latter yielded 22bush. per acre, and a splendid sample

where manured with 2cwts. super. per acre. The Hon. Secretary tabled sheaf of Purple Straw wheat after being thrashed by Mr. Moody's thrasher; also sample of grain from same. The crop was cut before quite ripe, and the straw was very rusty. The grain was, however, well filled. Mr. Reuter was of opinion that if the wheat had been left for the stripper the grain would have been very poor.

MALTING BARLEY.—Mr. Robinson sowed $\frac{1}{2}$ bush. of English malting barley and 1cwt. super. and got a return of seven bags clean grain per acre. A sample of the barley was tabled, and was much admired.

JOHNSON GRASS.—The Hon. Secretary tabled bundle of Johnson or Aleppo grass over 5ft. high, grown on light sandy soil without irrigation.

Crystal Brook, December 28.

Present—Messrs. J. C Symons (chair), W. Hamlyn, W. J. Venning, G. Davidson, P Pavy, W. Natt, A. Hamlyn, F. S. Keen (Hon. Sec.), and one visitor.

TAKEALL.—Members agreed that this was so infrequent in the district they were not in a position to give an opinion on the matter.

NORTHERN CONFERENCE.—Matters in connection with the Conference of Northern Branches, to be held at Crystal Brook on February 12, were dealt with. It was decided that on all papers, &c., discussed at the Conference a vote for or against should be taken.

IMPROVEMENT OF WHEATS.—Paper read by Mr. R. Marshall at Gumeracha Conference on improvement of wheats (page 476, December *Journal*) was discussed. It was unanimously resolved that this Branch is of opinion that the paper was a most valuable one, and that Mr. Marshall's suggestions are worthy of the serious consideration of the Minister of Agriculture. Mr. Venning stated that in reply to a question as to best wheats to sow Mr. Marshall wrote him that this was too large a contract for anyone to take up. Each farmer should experiment on his own behalf. He was giving up his work in connection with the improvement of wheat, as it was not sufficiently appreciated by farmers to induce him to carry it on.

Strathalbyn, January 20.

Present—Messrs. P. McAnaney (chair), D. Gooch, W. M. Rankine, A. Rankine, and J. Cheriton (Hon. Sec.).

SUGGESTIONS FOR IMPROVING THE BUREAU.—The Hon. Secretary read a paper dealing with Mr. Grasby's suggestions to the following effect:—

I do not fully indorse the views of Mr. Grasby. I agree with him as to the usefulness of Agricultural Bureaus, and that great good has been done to the State and individuals by meetings and the information conveyed through the *Journal of Agriculture*. That much more might have been accomplished if a little more energy and thought were engendered no one acquainted with the subject will deny; but the difficulty lies in the isolated condition to which farmers are subjected by living so far apart from each other, and to the fact that their laborious exertion on the farm during the day unfits them for study, and a per reading the daily or weekly papers are quite willing and ready to retire to rest. I agree with Mr. Grasby that the Central Bureau should be rejuvenated by the infusion of fresh blood, as that would be the means of keeping it up to date, and perhaps bring out new ideas that would be beneficial to the community at large. As to the Branch Bureaus Mr. Grasby is rather severe when he says our meetings are held without any definite purpose and that some of our best men have retired from their meetings on account of its aimlessness, &c. I do not think that he is right in his estimate of the cause; I think that the distance from the meeting place and the multiplicity of other engagements is the main cause of their retirement. If for any other

cause it says little for our best men. I agree with him that there is not sufficient effort put forth to secure outside information, and also that our young men do not take any interest in our meetings, as it is on them that the future of our State depends. The apathy of farmers in general is a state of things much to be deplored, as if they studied their interests it would not be the case. That the members of country Bureaus are not free from this complaint can be seen by perusing the attendance records of the meetings as published in the *Journal*, from four to ten being the number present; our own Branch bears very favorable comparison as to the attendance. I do not believe that increasing the number of members would be beneficial, for where there are fifteen members in each Bureau surely that is a number quite enough to carry on the work in any neighborhood if members would only interest themselves by getting their neighbors to attend the branch meetings and impress upon them the desirability of so doing. Visitors have a perfect right to attend and take part in the discussions, and ask what questions they consider would be of importance to the public. It is desirable that the Branches be better organized, and made the centres of agricultural extension work, but I do not agree with what he suggests, viz.:—(a) Reading courses, like those of the Cornell University; (b) short lecture course, such as are found to be so very useful in connection with the Farmers' Institutes of the United States and Canada, Yorkshire College, Leeds, and the county councils of England; (c) circulating agricultural libraries; (d) elementary science classes, such as were proposed by the Stockport Branch in 1897; and (e) the issuing of special bulletins. The first step for our Branches to take is to secure a regular attendance of their members, and through them the attendance of the public. When that is accomplished the suggestions of Mr. Grasby might be carried out successfully, and our present system of education should conduce very materially to its success, as our young farmers have had opportunities of culture that were not thought of in my young days.

SOUTHERN CONFERENCE.—It was decided to hold the Annual Conference of Southern Branches at Strathalbyn early in April.

Riverton, January 18.

Present—Messrs. W. Hannaford (chair), T. Gravestocks, Dr. Glynn, H. A. Davis, W. B. Davis, A. J. Davis, M. Nash, M. Badman, W. J. Kelly, and H. A. Hussey (Hon. Sec.).

TAKEALL.—Mr. Gravestocks considered the character of the season had no bearing on the prevalence of takeall. Different kinds of soil were affected, but a second crop after fallow on grubbed land seemed most liable. Dry ploughing and working appeared to increase the damage. Both manured and unmanured land are affected. He had known takeall for forty-three years, and would advise farmers not to work the land in dry weather. Mr. Nash agreed. Mr. H. A. Davis found sowing of oats a preventive. It was resolved that this Branch is of opinion that oats sown on properly-cultivated land previous to wheat is a preventive of takeall.

SUGGESTIONS FOR IMPROVING THE BUREAU.—Considerable discussion on this subject took place. Mr. H. A. Davis considered many of Mr. Grasby's suggestions excellent; there should be more energy and enthusiasm displayed by members of Branches. They should also get the young men to take more interest in the work of the Bureau. Dr. Glynn considered it essential that the Central Bureau should consist of the very best men obtainable; there should be no drones in that body. The experts connected with the Central Bureau should distribute information by means of pamphlets to the producers generally and through the Branches. The Branches should have a set programme drawn up suitable to the season, and members in turn should make it a point of duty to initiate discussion on the subjects selected. There must be some definite object in each meeting, instead of meeting time after time for a desultory conversation. It was resolved that this Branch favors the Central Bureau becoming an elective body, the Branches to have the right to representation thereon, and the Central Bureau should publish by means of pamphlets information on useful and practical subjects, prepared by the official experts, and distributed through the Branches to producers generally.

ZANTE CURRANTS.—Members wish to know whether it was advisable to graft Zante currants upon other vines, and if so what variety would be best. [Mr. Hardy states that he found the Zante did not graft well upon the Corinth currant, the Muscatel, or the Temporana, but did well upon Pedro Ximenes.—**GEN. SEC.**]

Mylor, January 18.

Present—Messrs. W. J. Narroway (chair), W. H. Hughes, E. J. Oinn, F. Newberry, E. Hayles, J. Smith, T. J. Mundy, J. Roebuck, C. Nielson, and W. G. Clough (Hon. Sec.).

SUGGESTIONS FOR IMPROVING BUREAU.—Mr. Grasby's paper discussed. Members are of opinion that all the expert officers attached to the Department of Agriculture should be members of the Central Bureau, and generally indorse Mr. Grasby's suggestions, except that they would have half the unofficial members elected by the delegates to the Annual Congress instead of by the official members of the Central Bureau. Members were of opinion that the maximum membership of fifteen was sufficient for the Branches, and that a paper should be read at each meeting, members taking it in turn to prepare a paper for discussion.

Booleroo Centre, January 20.

Present—Messrs. W. Michael (chair), Dr. Steven, J. H. Repper, G. Sargent, N. Clack, S. T. Parsons, J. Michael, T. McMartin (Hon. Sec.), and one visitor.

TAKEALL.—Members were divided as to what was takeall—the bare patches where everything disappears, or the bare patches with withered plants of wheat around them. The general opinion was that takeall was worse in wet seasons, and that the best land was most affected. It was worse on late fallow and with broadcast seeding. Where the drill is used and manure applied there is less takeall. Rolling appears to have no effect. Members wished to know whether takeall was caused by a vegetable parasite or by deficiency of something in the soil. [Question is not settled. The object of the discussions by members of Branches is to obtain information to enable this to be ascertained—**GEN SEC.**]

Davenport, January 16.

Present—Messrs. W. J. Trembath (chair), T. McDowell, F. B. Rathbone, W. Penna, T. Julian, W. Hodshon, sen., F. H. Pybus, T. Tottman, J. Holdsworth, and J. E. Lecky (Hon. Sec.).

TOMATOES.—Mr. McDowell tabled samples of tomato plants affected by disease. Mr. Hodshon stated that this was a matter of frequent occurrence, but there seemed to be no definite explanation as to the cause, unless it was deterioration in the seed. The Chairman had plants similarly affected, and said there was no seed that appeared to deteriorate so quickly as tomato seed.

POULTRY COMPLAINT.—Mr. Pybus reported his young turkeys to be suffering from "swelled head." There were no symptoms of any mucous discharge; it appeared to be an inflammatory swelling, which gradually extended until the whole head was affected, and blindness and death eventually resulted. The birds' appetites did not seem to be affected. Mr. Rathbone had cured fowls by rubbing the affected parts with chloride of lime and giving a tonic of sulphate

of iron. Mr. Holdsworth suggested boracic ointment, and the Chairman mentioned carbolic and lard, sulphate of iron being given as a tonic, and sometimes also a dose of Epsom salts was beneficial. [Mr. D. F. Laurie says this is roup. Carbolic oil, 1 in '5, to head and give large roup pill three times a day.—GEN. SEC.]

MUIR PEACH.—Mr. Holdsworth reported unfavorably of this peach; the fruit was not particularly good, though, being a good carrier, it might be suitable for the export trade. Mr. Rathbone considered the variety unprofitable, being small and tough, and of no appreciable flavor.

SAND-DRIFTS.—Some discussion on the inroads of drift sands in and around Port Augusta ensued. Mr. Rathbone attributed it to the destruction of vegetation on the sandy lands. He had suffered severely through the removal of timber from the roads and stock reserves. He thought they should have legislation to prevent the cutting of dry or green timber on the roads, as the timber was a natural breakwind. Trees should also be planted; the pepper tree would thrive here, and the aloes will grow on the sand. Pine and wattle seed should be planted. The question was of pressing importance, and he advocated the acquisition of a belt of land round the town, which should be fenced and planted with suitable trees and grasses, and stock prevented from consuming the feed. Reference was made by several members to the failure of marram grass planted here by the Railway Department, and the opinion was expressed that the rainfall was not sufficient to cause it to flourish. Mr. Holdsworth thought nothing was better than couch grass, and he urged that wheat and couch grass should be sown together on the sand. [Probably rye would be better than wheat for this purpose.—GEN. SEC.] The residents were probably responsible for the present state of affairs, through grazing stock on the sandhills. The Hon. Secretary referred to the work of the Davenport District Council, which, in spite of opposition, planted the sandhills with couch grass, and for a long time were successful in binding the sand, but through the inconsiderate action of the ratepayers this work had been nullified. He believed that with good rains the hills would soon be covered again by couch grass.

Richman's Creek, January 24.

Present—Messrs. W. Freebairn (chair), A. Knauerhase, J. J. Searle, A. Nicholson, J. H. Lehmann, M. Hender, W. J. Wright, P. J. O'Donohue, F. Mattner, J. McSkimming, J. M. Kelly, and J. McToll (Hon. Sec.).

TAKEALL.—Members were agreed that takeall was practically unknown in this district, but those who had experience with it in the southern districts agreed that it was worst on strong heavy land.

FALLOW CROPS.—Mr. Kelly's crop on fallow ground was not so good as that on the stubbles, and he attributed this partly to the fact that the former was sown dry early in April and the latter in May, after some rain had fallen. Mr. Knauerhase's experience was the same. The crops were poor, but the best were on the stubble land. Mr. McSkimming had best returns from fallow, and the Hon. Secretary stated that their crops on fallow land were much better than the stubble crop.

MANURE EXPERIMENTS.—The Hon. Secretary reported on experiments during past year with superphosphate for wheat crops. Three plots, each of five acres, were drilled in on fallow land on 7th and 8th June, 45lbs. per acre King's Early wheat being sown:—

Plot 1, manured with 80lbs. super.	per acre, yielded 11bush. 48lbs. per acre
" 2 " " 100	" " 11bush. 13lbs. "
" 3 " " 160	" " 11bush. 18lbs. "

The 80lb. dressing giving a slightly higher return at only half the cost of the 160lbs. The latter gave a thicker crop, but it suffered most in the dry weather. The rainfall for 1901 was 9·92in., but the only months in which an inch or more was recorded were July, August, and October. The previous year he got a return from 80lbs. super. of 18bush. per acre, with not quite 2in. more rain, but that year the rain was more timely, coming earlier in the season and giving the crop a better start. He was convinced that with 10in. to 12in. of rain 60lbs. of super. per acre was sufficient to apply, and would be profitable, but in districts with a higher rainfall it was probable that heavier dressings would prove more profitable.

Port Elliot, January 24.

Present—Messrs. J. McLeod (chair), W. E. Hargreaves, H. Pannell, O. B. Hutchinson, J. Nosworthy, H. Gray, C. Gosden, F. Basham, H. Welch, E. Hill (Hon. Sec.), and Thos. Hardy of Central Bureau.

FARMING.—Mr. Gosden read a paper on this subject to the following effect:—

To work a farm to the best advantage divide the land to be cultivated into three paddocks of about the same area; have one under crop, one in grass, and one fallow each year. By this method the land will be kept in good heart. On the grass paddock have sufficient stock to keep the grass short the year before fallowing, so that there is nothing left to go to seed. Fallow the land in July or August, but not when the ground is too wet, as it would set down hard. Do not work the land when too dry and cloddy, but plough when the rubbish has started, and the land is in good condition. After most of the heavy rain is over run the scarifier over the paddock to destroy any weeds that may have started on the fallow. Plough the ground not less than 6in. deep and turn it over well to kill the rubbish: it may sometimes be necessary to use skim-coulters to turn the green stuff under. If the land is fallowed early and kept free from weeds and rubbish you will get as good a crop from the application of 100lbs of super. as on stubble or other land simply ploughed up and sown at seeding time with twice that quantity of manure. He preferred to sow the seed and manure together, and would commence seeding about the 1st of May and get it finished as quickly as possible. Do not get on the land when it is too wet, but put in the seed while the land is in good working order.

Mr. McLeod thought the paper might apply to the northern districts, but here, with a heavier rainfall and the ground setting hard, this method of fallowing would not answer. Mr. Hardy considered fallowing a necessity where the rainfall is light. Mr. Gosden contended that the land must be fallowed if it is to be kept clean. Every farmer should keep sufficient sheep to supply meat, and cows to supply milk and butter required on the farm. Mr. Gray said the stripper had a tendency to make the land dirty, since it required the wheat to be dead ripe, and the seeds of wild oats and other weeds were on the ground before the wheat reached that stage. Mr. McLeod said wild oats were more in evidence along the coast than in the hills.

FRUIT-GROWING.—By request Mr. Hardy addressed members on various matters connected with orchard and vineyard work. He urged the necessity for conserving moisture on hill slopes; his practice now was to plough furrows across the face of the hill and fill them in at intervals by means of the hoe. Currant-growing he strongly advocated. Apricots grew to perfection in this district, and he was convinced there was a certain market in England for the dried fruit, as at present it was not used there to any large extent. With irrigation and manure it was possible to raise immense crops of green feed, &c. Mr. Hardy mentioned that a large apple-grower near Melbourne had wire-netted his orchard and kept large numbers of poultry, with the result that there had been a marked decrease in the codlin moth pest in the fruit. Mr. Hardy was driven round to several gardens in the district in company with members of the Branch, and gave those present a lot of valuable information on

various matters connected with the growing of fruit. He spoke favorably of the Daira or Almeida grape for export. Plums for drying involved too much labor, unless the work was done on a large scale. Almonds should pay well, especially on the steep hillsides, where cultivation was difficult; both hard and soft shell varieties should be planted. Olives should pay where it was not too cold. He had seen in Tunis trees reputed to be 300 years old, which were still bearing. Pickling olives was a difficult matter, but there was a good market for a first-class article. A hearty vote of thanks was accorded Mr. Hardy for his kindness in answering inquiries and giving members such valuable information.

Port Pirie, January 18.

Present—Messrs. T. Johns (chair), W. K. Mallyon, J. Lawrie, T. Gambrell, W. Smith, T. C. Jose, G. Hannan, and T. A. Wilson (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary's report showed that during the year eleven meetings had been held, the average attendance being seven. Four papers had been read and discussed, and on the whole the meetings had been interesting and instructive. Mr. T. Johns was elected Chairman, Messrs. H. B. Welch and G. M. Wright Vice-chairmen, and Mr. T. A. Wilson Hon. Secretary.

RABBITS.—Mr. Lawrie again directed attention to the spread of this pest and to the apathy of the district council and the ratepayers. Mr. Smith, one of the councillors, pointed out the difficulties in securing a conviction for neglect to comply with the Act. The council was doing all in its power, and were supplying an effective poison to the ratepayers. Phosphorus was not supplied, as it was dangerous to keep; but Mr. Lawrie contended it was the most effective, and could be safely kept in water. It was decided to suggest to the local council that dépôts be established in the infected districts, where phosphorus can be stored and obtained by ratepayers requiring same.

Clarendon, January 13.

Present—Messrs. J. Wright (chair), J. Spencer, A. Harper, J. Juers, E. Dunmill, J. Piggott, H. Payne, W. A. Morphett, and A. L. Morphett (Hon. Sec.).

BUREAU MEETINGS.—It was decided that members take it in turn to read a paper at the meetings of the Branch.

RED RUST.—Members found that rust was worse in wet thundery weather, and attributed it to the moist steamy conditions causing it to spread rapidly.

FARM LIFE.—Mr. Spencer read a paper on "How to Beautify the Home and Make Farm Life Attractive," to the following effect:—

Home life is largely what you make it, but the question of how to beautify the home is more complicated. With a house large enough to meet the needs of the household it can be made comfortable and beautiful, but if it is insufficient it is impossible to secure comfort and enjoyment. The outbuilding should be neat and compact, and capable of being utilised in any weather. Ofttimes the house is left to look after itself as long as it is possible to get along in any fashion: the roof of the kitchen may leak, the oven be out of repair, the pump shaky and almost unusable, and various conveniences missing. Under these circumstances the attractions of the home cannot be expected to be prominent. It is wise to study every method of economising labor. If water can be siphoned out of the tank do not draw it up with a bucket or buy a pump for the purpose. Fruit trees are worthy of a place in our attentions, as if carefully attended they provide pleasant and healthy food for the household. Do not forget ornamental trees for shade and shelter.

We should endeavor in Australia to put people on the land, and the first step is to stop writing down farming work. We want the general public to think as highly of the horny-handed cultivator of the soil as of the men who wear black cloth in the cities. Reading of the ancient civilisations, one cannot get away from the fact that as the land got into few hands so the prosperity of the nations declined. Having provided a comfortable home, the question of labor requires attention. Do not expect the boys and girls to work for unreasonable hours. If compelled to work for long hours at certain seasons, give the members of the household a pecuniary interest in the work. Give them the produce of an acre or two, or let them keep a few stock of their own. A few days ago a young fellow of 18 working on his father's place told me he had not received 2s. as pocket money during the whole of the previous year. The lad was equal to any average workman on the farm, and worth 25s. per week to his father. Can we expect the boys to be satisfied under such conditions? Let us show them that we want to make good practical men and not slaves of them, treat them as fairly as you would treat other men, and make the home life as pleasant as possible for them. Farming may not be conducive to the rapid accumulation of wealth, but it can be made one of the most interesting, healthy, and attractive of occupations, besides being profitable.

Quorn, January 25.

Present—Messrs. R. Thompson (chair), J. Cooke, F. Herde, G. Walker, and A. F. Noll (Hon. Sec.).

TAKEALL.—This is worse in wet seasons, and increases after good rains in spring. Loose friable land is most liable, and late fallow more than early. No knowledge of the action of drilling and manuring on the existence of takeall, and rolling has not been tried. Burning cocky chaff on the affected land has proved beneficial.

JOURNAL OF AGRICULTURE.—The Chairman urged all members to assist in making the *Journal* a thorough success.

FAR NORTHERN CONFERENCE.—Owing to the bad season just experienced it was considered advisable to abandon the Conference this year.

Reeve's Plains, January 17.

Present—Messrs. W. H. George (chair), E. Hancock, W. S. Corden, W. Day, H. Day, A. Modra, W. Cawse, and J. McLeod (Hon. Sec.).

TAKEALL.—Members were of opinion that where the land is manured with super. the disease does not affect the crop to any extent.

RED RUST.—A long discussion on this subject took place. Mr. W. Day found rust existed in the crops every year to a certain extent, and with moist sultry weather in the spring it always developed rapidly. Early wheats were not so liable to injury as the later sorts. Some members considered frost had a lot to do with the spread of rust. Mr. Hancock found rust worst on moist land, the higher and drier soils being less liable. The disease was worse this year than for over thirty years past. Mr. Corden considered rain in October the cause of the trouble, but if cold wintry winds follow, rust does not seem to spread. He found Sydney Purple Straw wheat but little affected. Mr. Modra had seen rye affected by rust this year, a thing he had never noticed before. Early wheats escaped rust as a rule if sown early. Mr. Cawse had sown Dart's Imperial wheat early, and had a splendid sample. The Chairman found rust worse on the thin straw wheats. He spoke highly of Marshall's No. 3; Majestic was also very good and free from rust, but rather late. Dart's Imperial had a bad name in many parts, but it was one of the favorite wheats in this locality, and he considered it a splendid variety. He advocated the sowing early of early varieties, and the cultivation of the best rust-resistant wheats they could obtain.

Nantawarra, January 24.

Present—Messrs. James Nicholls (chair), R. Nicholls, E. J. Herbert, A. F. Herbert, T. Dixon, jun., R. Uppill, A. I. Greenshields, E. Pridham, S. Sleep, J. W. Dall, G. Belling, and H. J. Spencer (Hon. Sec.).

TAKEALL.—In November *Journal* Mr. Sleep was reported, in error, to have stated that wheat planted too deeply was affected by takeall; the seed of the affected plants was sown at medium depth only. Discussion on takeall took place. It was agreed that it was worse in wet seasons and increased after spring rains; most frequent on loose light scrub lands, both on fallow and freshly-ploughed land; worse on late fallow. Drilling and manuring does not appear to prevent it, nor does the use of farmyard manure. Rolling does not prevent. Takeall appears to spread very rapidly after heavy rain in spring, especially if followed by close sultry weather. Land worked in a dry state is most affected; consolidating the land by harrowing frequently when in a moist condition appears to have a good effect. The time of its appearance varies with the season; the past year it appeared late, but spread rapidly.

Forest Range, January 23.

Present—Messrs. J. Rowley (chair), R. Green, W. McLaren, F. Green, F. Mason, A. Green, E. Rowley, J. Green, J. C. Jennings, G. Monks, and H. H. Waters (Hon. Sec.).

FRUIT-GROWING ON GOOD SOIL.—Mr. J. Green read the following paper on the advantages of growing fruit on good soil:—

I mean by good soil well-drained hillsides, not the low black ground; but I would not object to the latter if it was well drained. If you take notice when you are grubbing the natural timber growing on this soil you will find a good many of the tap-roots are rotten; and if the natural timber is like this I do not think fruit trees will last long unless it was well drained. With our limited area of black soil I think we can use it for other purposes, so we will deal with the hillsides, the best of which have 1ft. to 18in. of dark soil with a red clay subsoil; and the better the soil the better, I think, it will pay for fruit-growing. The advantages start from the time you plant the tree. The first thing, the tree will make good growth, and without good growth you cannot form a good-shaped tree. I have seen trees on poor soil, after they were cut back, instead of sending out two or more shoots send out only one. Of course you can manure and force the trees to grow, but that takes time and money. The real advantage commences when the tree starts to bear. We will deal with the apple, which is our most important fruit with our export trade before us, and which does well in this locality. Perhaps the first year it bears, the fruit will be overgrown and go puffy if it has only a few on, but when it has a fair crop they will be all right. The tree will bear several years running without being hurt, and you have good large fruit of good quality and plenty of color. Now, on poor soil, as soon as your tree starts to bear any fruit to speak of, the tops of the tree die back, and instead of getting larger it gets smaller; and if you do not want to lose your tree you have to cut it back and manure. All authorities say that sooner or later the best of soils will become deficient in humus; if this is the case you all know the difference of growing green stuff on good soil and poor. If we have to add humus to the soil it would have to be a good heavy crop, and this would not be easy on poor soil. A fruitgrower in the Angaston district told me they had to plough their orchards once or twice each season, merely to keep down the so-called dandelion, which would make excellent humus. Whether this makes any difference to their fruit I do not know, but I never saw there a better sample of fruit than I saw last season, though they were highly colored, and the soil generally is of the best quality. And, besides, nearly all diseases are worse on the tree grown on the poor soil; and naturally, for the constitution of the tree is weaker.

It was generally agreed that the better the quality of the soil the better the fruit; especially with stone fruits was this the case.

SOUTH AUSTRALIAN RAILWAYS.

Parcels and Passengers' Luggage.

COLLECTION AND DELIVERY AT ADELAIDE, PORT ADELAIDE, AND GLENELG.

The attention of passengers is called to the fact that the Railway Department collects and delivers all parcels and luggage in Adelaide, Port Adelaide, and Glenelg, or in the suburbs mentioned below, thus avoiding inconvenience and loss of time to passengers. Such parcels and luggage will not, however, be accepted for delivery on board any vessel lying at Port Adelaide, but passengers claiming their luggage at that station can have it carted to the wharves or sheds where vessels are loading.

The charges for collection or delivery are as follows :—	In Adelaide, Port Adelaide, or Glenelg.	To or from any of the undermentioned Suburbs.
	<i>s. d.</i>	<i>s. d.</i>
<i>* Luggage.</i>		
For each package not exceeding 28lbs.	0 3	0 6
For each package exceeding 28lbs., but not exceeding 112lbs.	0 6	1 0
For every additional 112lbs., or part thereof, per package ..	0 6	1 0
<i>Parcels.</i>		
For each parcel not exceeding 14lbs. in weight	0 3	0 6
For each parcel exceeding 14lbs. but not exceeding 56lbs. ..	0 6	1 0
For every additional 56lbs., or part thereof, per package	0 6	1 0

* Charges to be made on the aggregate weight when luggage belongs to one person.

Delivery carts leave the Adelaide Station on week-days at 9 a.m., 11 a.m., 2 p.m., and 4.30 p.m., for delivery within the municipal boundary of Adelaide ; and for delivery in the suburbs at 2.15 p.m. ; at Port Adelaide as often as may be required between the hours of 8.0 a.m. and 6.0 p.m.

Special attention will be given to this service in order to ensure prompt and safe delivery. Unless parcels received in Adelaide and Port Adelaide are addressed "To be left till called for," the Department will deliver at above rates.

Suburbs to which the Collection and Delivery Service Extends.

Adelaide Municipality—Clarence Park, College Park, College Town, Eastwood, East Adelaide, Frewville, Gilberton, Goodwood, Hackney, Hyde Park, Hilton, Kenilworth, Kensington, Keswick, Kent Town, Malvern, Medindie, Mile End, Norwood, Parkside, Portland, Prospect, Rose Park, Rosewater, Stepney, Southwark, Thebarton, Unley, Unley Park, Victoria Park, Walkerville.

Port Adelaide Municipality—Birkenhead.

Glenelg—Somerton.

Notice to Passengers.

If you require your luggage delivered by the Department, either in Adelaide, Port Adelaide, or in any of the above-mentioned suburbs, have it fully addressed, and hand it to the stationmaster at the station where you begin your journey, who will arrange to forward it.

PARCELS RATES.

Any distance not exceeding—	Weight not exceeding						For each additional 14lbs. or part thereof.
	7lbs.	14lbs.	28lbs.	56lbs.	84lbs.	112lbs.	
10 miles	s. d. 0 6	s. d. 0 6	s. d. 0 6	s. d. 0 8	s. d. 1 0	s. d. 1 4	s. d. 0 2
20 "	0 3	0 6	0 6	1 0	1 6	2 0	0 3
40 "	0 6	0 6	0 8	1 4	2 0	2 8	0 4
60 "	0 6	0 6	0 10	1 8	2 6	3 4	0 5
80 "	0 6	0 6	1 0	2 0	3 0	4 0	0 6
100 "	0 6	0 7	1 2	2 4	3 6	4 8	0 7
140 "	0 6	0 8	1 4	2 8	4 0	5 4	0 8
180 "	0 6	0 9	1 6	3 0	4 6	6 0	0 9
220 "	0 6	0 10	1 8	3 4	5 0	6 8	0 10
260 "	0 6	0 11	1 10	3 8	5 6	7 4	0 11
300 "	0 6	1 0	2 0	4 0	6 0	8 0	1 0
For each additional 50 miles or part thereof }	—	0 1	0 2	0 4	0 6	0 8	0 1

When two or more parcels are consigned to one person the above rates are charged on each parcel separately.

Parcels addressed "Murray Street Terminus, Gawler," "To be called for," may be booked at station to station rates.

Fresh meat, butcher's small goods, and fresh fish (when in baskets or boxes, or packed in bagging or calico), butter, eggs, dead poultry, game, mushrooms, cut flowers, ice in boxes or bags, and South Australian fresh fruit are carried at half parcel rates; minimum charge 6d. This applies also over Silverton Tramway. Unless such packages are marked "Till called for" they will be delivered in Adelaide and Port Adelaide at the following rates:—Not exceeding 14lbs., 3d.; not exceeding 56lbs., 6d.; not exceeding 112lbs., 9d.; not exceeding 224lbs., 1s. 3d.; not exceeding 336lbs., 1s. 9d.; for each subsequent 112lbs., or part thereof, 3d. The South Australian rail and delivery charges are to be calculated on the aggregate weight of each consignment, and the latter charges must be doubled for delivery outside the city but within a radius of two miles of the General Post Office.

All fish, fruit, meat, poultry, and other perishable articles are conveyed at owners' risk, and are liable to immediate sale if not claimed and charges paid on arrival.

Packed parcels in hampers, crates, bags, cases, or other packages are charged quadruple parcel rates, and the onus of proving that the parcels are not packed rests with the consignees or consignors.

The Railways Commissioner will not be accountable for any parcel above the value of £5, unless the nature and value of the articles or property contained in such parcel shall have been declared by the sender, and an insurance rate equal to 1 per centum upon such declared value shall have been paid, in addition to the amount chargeable by the foregoing scale of rates.

Feathers, furniture, glass, hats, bonnet and hat boxes, cases of millinery, straw bonnets, mirrors, musical instruments, sulkies in pieces, pictures, sewing-machines, wickerwork, wire cages, or other articles light or fragile, are charged 50 per cent. above parcels rate (Port and Glenelg lines excepted).

Returned empties, actual weight, single rate, must be prepaid.

Parcels which are intended to be booked by any particular train must be delivered at the forwarding station at least fifteen minutes previous to its departure; otherwise they may be detained until the departure of the following train.

Parcels waybilled, and addressed "To be left till called for" at the chief stations, will, if not called for within forty-eight hours thereafter, be subject to the same charges and regulations as left luggage.

The Railways Commissioner will not be responsible for the loss of, or damage to, any goods or parcels addressed "To be left till called for."

No live small animal or bird will be received for carriage by railway unless confined in a proper coop or case, and the stationmasters and guards will be authorised to refuse any coop or case which, in their judgment, is too small for the purpose to which it is put, or, being fit, is so overcrowded as to cause needless suffering to the birds or animals it contains.

PARCELS FOR OCEAN STEAMERS.

For an additional charge of 1s. for each 56lbs., or part thereof, parcels will be placed on board ocean steamers at Largs Bay.

CREAM AND MILK.

These will be carried, at owners' risk only, in the brake-vans of passenger trains at the rates and subject to the conditions following:—

Not exceeding 25 miles ½d. per gallon

For each additional 25 miles, or part thereof ½d. "

Minimum charge 6d.

Skimmed milk from butter and cheese factories, to which it has previously been carried by rail as fresh milk:—

Not exceeding 25 miles ½d. per gallon

For each additional 25 miles, or part thereof ... ½d. "

Minimum charge 3d. "

Cream and milk will only be received in properly constructed drums, which must be quite water-tight. Each drum must be impressed with its capacity in gallons, and with the names of the owner and station.

The charge will be made upon the capacity impressed upon the drum.

Empty return drums, 1d. for each consignment of 28lbs. or part thereof for each 100 miles or part thereof.

COOL CHAMBERS.

During the hot season cool chambers run as under:—

Between Adelaide and Broken Hill.

From Adelaide on Tuesdays and Thursdays, at 5.30 a.m.

From Broken Hill on Wednesdays and Fridays, at 8.10 a.m.

Between Port Pirie and Broken Hill.

From Port Pirie on Mondays and Thursdays, at 6.50 a.m.

From Broken Hill on Tuesdays and Fridays, at 8.10 a.m.

Between Adelaide and Quorn.

From Quorn on Mondays and Thursdays, at 8.18 a.m.

Between Adelaide and Moonta.

From Adelaide on Wednesdays and Mondays, at 7.40 a.m.

From Moonta on Thursdays and Tuesdays, at 8.25 a.m.

Between Adelaide and Port Pirie via Blyth.

From Adelaide on Tuesdays and Fridays, at 5.30 a.m.

From Port Pirie on Thursdays and Mondays, at 9.28 a.m.

Between Adelaide and Mount Gambier.

From Mount Gambier on Tuesdays and Thursdays, at 7 a.m.

Between Adelaide and Eudunda.

From Adelaide on Wednesdays and Saturdays, at 11.50 a.m.

From Eudunda on Thursdays and Mondays, at 10.20 a.m.

Between Adelaide and Milang.

From Adelaide on Mondays and Thursdays, at 7.30 a.m.

From Milang on the same days, at 2.40 p.m.

From Quorn to Hergott Springs.

On each Saturday, at 8.34 a.m.

Packages of butter only will be received for conveyance by these chambers, but must be so marked.

Goods forwarded in the cool chambers will be charged half parcels rates, minimum 6d.

DELIVERY CHARGES, FREEZING DEPOT, PORT ADELAIDE.

On packages sent by passenger train:—

For each consignment not exceeding	14lbs.	.....	3d.
" " "	56lbs.	.....	6d.
" " "	112lbs.	.....	9d.
" " "	224lbs.	.....	1s. 3d.
" " "	336lbs.	.....	1s. 9d.

Each subsequent 112lbs. or part thereof..... 3d.

Carriage and delivery charge must be prepaid.

PARCELS DELIVERY, COUNTRY TOWNS.

Parcels, *unless* directed "*To be left till called for*," will be delivered within the municipal boundaries of Gawler, Kapunda, Port Augusta, Wallaroo, and Moonta at the following rates:—Parcels up to 112lbs., 6d.; above 112lbs. and not exceeding 196lbs., 1s.; above 196lbs., 1s. 6d.; Mount Gambier, irrespective of weight, 3d.



INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

Number of Persons Registered and Found Employment by Government Departments and Private Employers from December 24, 1901, to January 28, 1902.

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youths	111	244	337
Carpenters	9	1	4
Masons and bricklayers	4	2	8
Plasterers	1	—	3
Painters	7	5	34
Stonecutters	—	—	6
Blacksmiths and strikers	9	3	—
Boilermakers and assistants	2	1	—
Enginedrivers	1	5	—
Fitters and turners	2	1	1
Machinists	1	1	—
Iron moulders	1	2	—
Ironworkers and plumbers	5	—	—
Carriage trimmers	1	—	—
Warders	2	—	5
Gardeners	1	—	—
Bootmaker	1	—	—
Bookbinder's improver	1	—	—
Compositor	1	—	—
Nurse (male)	1	—	—
Chainman	—	—	1
Apprentices	14	1	3
Cleaners	12	4	—
Porters and junior porters	10	7	—
Rivet boys	2	—	—
Totals	199	277	402

January 29, 1902.

A. RICHARDSON, Bureau Clerk.

The Early Closing Act, 1900, and The Early Closing Amendment Act, 1901.

EPITOMISED BY THE CHIEF INSPECTOR OF FACTORIES.

The provisions of the Early Closing Acts apply to the metropolitan shopping district, comprising the electoral districts of North Adelaide, East Adelaide, West Adelaide, East and West Torrens, Sturt, and Port Adelaide. The Early Closing Acts also apply to such country shopping districts as may from time to time be proclaimed by the Governor.

"Shop" means the whole or part of any building, stall, tent, vehicle, or pack in which goods are offered or exposed for sale by retail.

"Shopkeeper" means any occupier directly or indirectly as principal of any shop, any licensed hawker, or any person having the management of any shop.

"Exempted goods" means goods dealt in by and strictly pertaining to the classes of shops and trades included in the First Schedule and declared by regulation to be exempted goods. (*See* "Exempted Shops.")

"Closing time" means closing time fixed or appointed pursuant to the Early Closing Act, 1900, and the Early Closing Amendment Act, 1901. The amending Act is to be read and construed and be concurrent with the principal Act.

The closing times appointed for all shops in the metropolitan shopping district not exempted under the Act are as follows:—Monday and Tuesday, 6 o'clock; Wednesday, 1 o'clock or 6 o'clock, whichever of these times is chosen by the shopkeeper; Thursday, 6 o'clock; Friday, (a) 6 o'clock where the closing time on the preceding Wednesday was 1 o'clock, (b) 9 o'clock where the closing time on the preceding Wednesday was 6 o'clock; Saturday, (a) 1 o'clock where the closing time on the preceding Wednesday was 6 o'clock, (b) 9 o'clock where the closing time on the preceding Wednesday was 1 o'clock.

Christmas Eve is exempt, and the closing time may be as late as desired.

The closing time may be extended to 9 o'clock on the evening of the weekday immediately preceding a public holiday, but if this is done the closing time must not be later than 6 o'clock on any other evening of that week.

Assistants in shops must cease to sell or offer goods for sale at the time appointed for closing the shop, but the shopkeeper, or the husband or wife of the shopkeeper, and one member of his family, may keep the shop open and continue to sell until 9 o'clock on any weekday except the day when the time appointed for closing the shop is 1 o'clock, when the shop must be closed against all further sales or offers to sell for the remainder of the day. The manager of a shop is not deemed to be the shopkeeper for the purpose of trading after the closing time fixed for the shop.

All persons employed in a shop are to be allowed a half holiday, from 1 o'clock on the day fixed for closing at that hour, and a shopkeeper must not employ any such persons after the closing time so fixed, except to serve persons already in the shop at the closing time, and to adjust the goods, and close the shop, but the time allowed for so doing must not extend beyond half an hour from the closing time.

Persons under the age of 16 years are not to be employed for more than fifty-two hours in one week in a shop, nor more than nine hours in any one day, except on one day in a week, when not more than eleven hours may be worked.

The Minister may, however, by written consent, permit the employment of such persons for twelve hours or a less time in one day, but such consent will not apply to more than forty days in one year.

Every shopkeeper is required to make a choice of the closing time for his shop by filling in the prescribed form and forwarding the same to the Minister, or to the Chief Inspector of Factories, Police Court Buildings, Victoria Square, who is authorised by the Minister to receive all notices under the Acts. A copy of the notice of choice is to be affixed, and kept affixed, in a conspicuous position in every shop front window, the printing to be in solid block letters boldly displayed on a sheet of a size not less than 12in. by 9in.

No change of the day of closing at 1 o'clock can be made until after the expiration of three months from the date of making the previous choice, and one month's notice of the intention to make another choice must be given to the Minister before the change can be made.

A copy of the later choice of closing time must then be affixed in the shop front window.

Public Holidays.

Every shopkeeper who keeps his shop closed on the whole of any public holiday, which is kept on a Monday, will not be required to keep the half holiday on the preceding Saturday or the following Wednesday; and all shopkeepers who close their shops during the whole of a public holiday which is kept on any other day than Monday, will be exempt from keeping the half holiday appointed under the Act in that week.

Exempted Shops.

Chemists and druggists, restaurants, eating houses, and refreshment shops, cooked meat, and butchers' and bakers' small goods, fish and oyster shops, fruit, flower, and vegetable shops, tobacconists, hairdressers, confectioners, news agents and bookstalls at railway stations, undertakers, public houses, licensed wine shops, milkmen.

All shop assistants employed in any exempted shop *must be allowed* a half holiday from 1 o'clock in the afternoon of some weekday in every week, except in a week in which there is a public holiday allowed to such assistants as a holiday. In the case of assistants employed in preparing and serving up meals and refreshments they may continue doing so until 2 o'clock.

The following is a list of the goods which have been declared by regulation to be exempted goods, and may be sold in exempted shops:—Drugs, medicines, medical and surgical implements and appliances, cooked food, butter, cheese, tea, coffee, cocoa, milk, non-alcoholic drinks, cooked meat (not being tinned meat in unopened tins), sausages, meat pies, sandwiches, rolls, cakes, tarts, pies and other bakers' small goods, fresh fish, smoked fish, cooked fish (not being tinned fish in unopened tins), fresh fruit, fresh vegetables, cut flowers, tobacco, cigars, cigarettes, snuff, tobacco pipes, cigar holders, cigarette holders, matches and match boxes, tobacco pouches, perfumes, hair washes, hair oil, lollies, sweetmeats, newspapers, magazines, journals, coffins, coffin furniture, spirituous and fermented liquors (as allowed by licence under the Licensed Victuallers Act, and not otherwise).

The Governor may by proclamation temporarily suspend the operation of the Act in so far as it applies to the closing time for any shop or shops on any occasion when such a course may seem necessary or desirable.

Country shopping districts are proclaimed by the Governor on receipt of a memorial signed by a majority of the shopkeepers in the proposed country shopping district, and should be in the form set out in the Second Schedule to the principal Act.

The boundaries of the proposed country shopping districts should be clearly defined, and the times for closing all shops within such boundaries set out in the memorial.

No alteration of the closing time fixed for shops in a country shopping district can be made until after the expiration of twelve months, when another memorial, signed by a majority of shopkeepers, may be presented setting out the desired alterations. Every such memorial must be accompanied by a declaration in the form set out in the regulations made on the 3rd day of January, 1901, verifying such memorial.

All inquiries should be addressed to the Chief Inspector of Factories, Victoria Square, Adelaide.

Journal of Agriculture

AND

Industry.

No. 8. REGISTERED AS

MARCH 1, 1902.

[A NEWSPAPER.]

VOL. V.

NOTES AND COMMENTS.

The *Register's* estimate of the 1901-2 wheat yield of this State is for a total of 8,750,000 bush. The area sown was approximately 2,000,000 acres, but only about 1,500,000 acres were reaped for wheat. The prevalence of red rust resulted in a larger area than usual being cut for hay. The returns from the outside districts and the Murray Flats were very poor, the rainfall being much under the average. The yield is estimated at 5 bush. 50 lbs. from the whole area reaped, but the average from the areas within the line of rainfall is considerably higher than this. It is estimated that, allowing for seed and local demand for flour, &c., there will be 146,000 tons of the new crop available for export, besides 12,000 tons of old wheat.

Mr. A. Steinwedel, of Balaklava, received last season from Professor Lowrie seed of Jerkin and Warwick, two new cross-bred wheats. These were sown on June 10th on fallow land, receiving 1½ cwt. of super. per acre. Owing to the dry weather the wheat did not germinate until about the end of the month. The wheats ripened about the 18th November, both being attacked by rust, Jerkin more so than Warwick, but in each case the grain was not affected. They yielded at the rate of 12 bush. per acre, which Mr. Steinwedel considered very satisfactory taking into consideration the poor germination and low rainfall. Both wheats appear to be definitely established crosses, as they reproduce true to type throughout, and are worthy of extended trial in this State.

A successful farmer from Golden Grove district told the writer a few weeks ago that the experience of farmers in that district was that Galland's Hybrid wheat did not apparently rob the soil to the same extent as other wheats, but they did not know why this should be. The experience of other farmers on this point would be interesting; probably the majority will ridicule the idea. Yet there may be something in it. In the first place, Galland's Hybrid is a very hardy and heavy-yielding wheat, and resists dry weather better than most wheats grown in the district. It is a well-known fact that with some wheats the roots penetrate much deeper than with others, and it is not impossible that

this may be the explanation of the phenomenon referred to. If the roots go deeper in search of moisture and plant food the area of feeding ground is increased, and the soil near the surface is not perhaps drawn upon to the same extent as with shallower-rooting varieties. Besides which the roots will doubtless bring up from below some of the stores of food which will be left in the ground by the decaying roots, &c., after the crop is harvested.

At a Conference of Ministers of Agriculture, held in Melbourne in September last, it was resolved to ask the New Zealand Government to relax the regulations which absolutely prohibited the importation of grapes. The Hon. Minister of Agriculture has been advised that the New Zealand Government cannot see their way to make any alterations in the regulations at present, so that no grapes from Australia can be sent to New Zealand.

The statement published in the Queensland papers by the Agricultural Department, that they had received an inquiry from an Adelaide merchant for Queensland bacon owing to the South Australian product being of an inferior character, has caused much discussion in this State. Adelaide merchants handling pig products give an unqualified denial to the statement that our bacon is inferior, and point to the fact that it has more than held its own in competition with the produce of the neighboring States. As a matter of fact, though some inferior bacon is produced here, much of it is of a very high quality. The fact that imports of British hams and bacon have fallen from 247,126lbs. to 164,106lbs. since 1897 and our exports of bacon increased from 91,114lbs. in 1897 to 3,241,010lbs. in 1900 is sufficient proof of the absurdity of the statement that good bacon is not produced in South Australia.

Last season Victoria exported 130,000 head of poultry to the Cape and to London, and the exporters have large orders for spring chickens for London. The head of the poultry branch of the Victorian Department of Agriculture states that there has been a marked improvement in the quality of the produce coming forward due to the use of pure-bred stock for crossing with the ordinary fowls of the farm. He also states that the prices realised are paying. When will South Australian farmers wake up to the importance of the export trade in poultry? In view of the high prices ruling for meat and fish there ought to be a deal more attention paid to table poultry, for which profitable prices can be secured. By "table poultry" is meant birds with some meat on them, and not a mere framework with nothing on it besides skin and feathers.

Mr. F. Cole, of Renmark, received a letter from a London firm of fruit-dealers (Graham & Co.), in which it is stated that the cost of freight on oranges and lemons from Australia is so high that growers can do better by selling in their own markets at 6s. to 7s. per case than sending to Great Britain. Large cases of Naples lemons, 420 in case, realise 14s. to 23s.; oranges, 200 in case, good sized fruit, 12s. There is 7s. per hundredweight duty on dried apricots, and Californian sells at 56s. to 60s. per hundredweight. When duty, freight,

landing, and other charges are deducted it appears there would be little left for the grower, and it might pay better to sell in the producer's own markets. Messrs. Graham strongly recommend growers to stick to their own part of the work and leave shipping and export dealing to merchants and others who understand all the ins and outs of the business. He says, "About Whitsun, 1901, there were some very beautiful South Australian apples on this market. *I never saw anything more perfect*, but they only fetched 12s. to 13s. per box at the auction sales. I have no doubt in the retail shops in Regent Street and such places the price was 4d. or so each apple."

It hurts to play with nettles, and the only safe way to root them out by hand is to boldly grasp and pull them up. Half-hearted measures are never fully successful; and this has all along been illustrated by our dealings with the codlin moth and many other pests. The export apple industry is one of great possibilities, and this fact has been recognised by several enterprising individuals, who have planted large areas with apple trees. Most of those who have a fair number of trees actively employ every means to reduce the number of codlin moths, but there are many owners of a few trees who cannot or will not intelligently adopt any remedial or preventive measures, and yet are clamorous to be allowed to gather up their neglected and "wormy" fruit for disposal in the market or elsewhere in competition with the sound and selected fruit vended by their careful competitors. The questions may be considered as to whether this is fair and honest competition; whether the export fruit industry is worthy of development; whether the State Government is justified in the adoption of "drastic" measures to prevent the ruin of large growers through the neglect by a few growers to adopt reasonable measures for the suppression of the pest. Would it be reasonable to demand that every person who objects to or approves of the adoption of so-called "drastic" measures should show how many apple and pear trees he owns, and what remedial measures he has adopted, and when and how, to check the increase of codlin moths? Objection has been raised to the provision in a recently-considered Bill before Parliament that fines from £5 upwards are provided; but those objectors appear to have overlooked the fact that under the Justices Procedure Act the magistrate has the power to reduce the fines to a minimum—a power which in the past has been very freely exercised in prosecutions for breaches of the Vine, Fruit, and Vegetable Protection Act.

Those horticulturists who propose to save cuttings or scions for budding, grafting, or rooting would do well to note which are the strongest, best, and most prolific vines or fruit trees, and to select those canes or branches which have produced the best and largest quantity of fruit. If barren branches or deficient-yielding portions of trees or vines are selected for propagation it is possible that the result will be unsatisfactory.

In Mr. C. French's annual report to the Victorian Minister of Agriculture, just received, he expresses the opinion that every nursery for plants should be provided with a small fumigator, and that all plants before being sent away from the nursery should be subjected to fumigation with hydrocyanic acid gas to destroy every kind of insect pest. All plants and fruits sent to Victoria

from other places should be disinfected from insect and fungus pests before leaving the port of debarkation or the place in which they have been grown. Nearly everybody knows that nursery stock is a most fertile agent in the distribution of plant diseases, and he can see no fun in trying to exterminate pests in Victorian orchards whilst allowing diseases to come in over the borders without check.

Every breeder of animals and every cultivator of plants ought to know that plants and animals will quickly revert towards the original type unless great care is taken to maintain the improvement already arrived at. The effort to improve "the breed" must be incessantly continued. It is like walking up a steep and slippery hill—very easy to slide back, but difficult to reach the top. There are possibilities ahead that can be estimated, and may be realised if sufficient care is devoted to their attainment; but a year of neglect may require several years of scrupulous attention to remedy the relapse towards the wild or original type.

The fruit fly has now become a serious menace to the fruit-growing interest in West Australia, and a deputation that waited upon Dr Jameson (Minister of Lands) recommended that all fruit trees in West Perth should be destroyed. It was stated by Mr. Lindley Cowen (Secretary to Department of Agriculture) that the fly attacked every kind of fruit, even pig melons. The Minister was not agreeable to have all fruit trees destroyed in the locality named, even were compensation to be allowed, and he suggested spraying and other remedies that were in use in Italy, whence the fly was introduced. Now, there is no necessity to destroy any tree, either for extinction of fruit fly or codlin moth. If all the fruit were destroyed or prevented in setting, by spraying the trees with Paris green whilst in bloom, there would be no fruit for the maggots or caterpillars to feed upon; consequently they would starve, and the pest would be exterminated in one season.

THE WHEAT HARVEST.

The *Register* publishes the following estimates of the wheat harvest for the past eleven years:—

Season.	Acres.	Total Yield.	Average Per Acre.	
			Bush.	Lbs.
1890-1.....	1,673,573	9,399,389	5	37
1891-2.....	1,544,600	7,373,770	4	46
1892-3.....	1,710,355	11,435,272	6	41
1893-4.....	1,725,423	14,042,125	8	8
1894-5.....	1,552,900	7,557,446	4	52
1895-6.....	1,621,910	6,658,600	4	22
1896-7.....	971,930	2,690,100	2	46
1897-8.....	987,250	3,705,937	3	45
1898-9.....	1,550,000	9,816,666	6	20
1899-0.....	1,700,000	10,200,000	6	0
1900-1.....	1,600,000	13,200,000	8	15
1901-2.....	1,500,000	8,750,000	6	50

These figures include the whole wheat-growing areas of the State. The average for the portion of the State within the line of rainfall is considerably higher than these figures indicate.

FOREST PLANTING AND TIMBER SUPPLY.

BY F. E. H. W. KRICHAUFF.

No. 4.—Effect on Rainfall and Temperature. Suitable Trees for Planting.

We have for South Australia no figures which show how far we have drawn on our forest capital. That we have done so at a very large ratio is quite certain. Exports from our own forests have of late years, however, been on an insignificant scale, as mentioned before. We cannot say that, as in India, the famines occurring periodically in certain large portions of that vast empire are a consequence of deforestation; but the ill-success of farmers beyond Goyder's line of rainfall is through absence of rain, and absence of forests may to a considerable degree have prevented a sufficient rainfall, and the bleak or hot winds, or sometimes frosts, contributed there to the failure of crops. We will admit that a belt of mallee, or country dotted with only a few trees, cannot make moisture. Laden clouds discharge their millions of tons of water, or greatly influence the climate, and we agree with Mr. Hannemann, of Arden Vale, that human agency can neither set up mountain ranges nor create cool air for our North; but cannot we mitigate scorching heat or cold and obtain in time a somewhat larger rainfall by planting real forests. That the rainfall diminishes where forests are destroyed is undoubted, and where they are re-established the rainfall increases. According to most authorities dried up springs, or even rivers and lakes gain a new supply of water. Von Humboldt relates that a town near the Lake of Valencia, in Venezuela, found itself after 200 years two miles from the lake, in consequence of the extensive destruction of the forest; but twenty-five years later, when the forest had regained possession of the soil, the waters of the lake gradually rose again. The island of Ascension lost and regained its spring under like circumstances. Our former Governor, Sir Anthony Musgrave, who was a Governor in the West Indian Islands, also stated that nobody could cut any timber at King's Hill Forest without direct permission from the Governor, and the result was that it was celebrated for its fertility, and there was far more humidity than in Barbadoes and Antigua, where the timber had been cleared. Mauritius and St. Croix met with a like deterioration of the climate, as also Spain, which was visited by Mr. E. J. Hector, of Wandearah, who dates from the practical wiping out of her forests the commencement of her political, agricultural, and industrial decline. The destruction of the timber on the slopes of the Alps and Cevennes has compelled France to expend untold millions in the trial to reforest many hundreds of miles, and thus to prevent the utter ruin of the settlers, and devastation by sudden inundations. The climate of Iceland, which was formerly well wooded, is now depopulating that island.

At seven different places, during five years, have 5,000 observations been made in Bavaria as to the influence of forests on the temperature and moisture of the air, also the evaporation of water, the rainfall, &c. Ingeniously constructed instruments measured, twice a day at fixed hours, the temperature of the soil in the open and in the forests, at the surface, and at a depth of 6 in., 1 ft., 2 ft., 3 ft., and 4 ft. Results: That the mean annual temperature of the soil of the forest is 21 per cent. lower than that in the open field, and the mean annual temperature of the atmosphere 10 per cent. lower; also the equalising effect in lowering the extreme summer heat and in lessening the cold of the winter. It is admitted that the higher the temperature the more moisture can the air absorb and retain without discharging it in the form of rain, fog, or dew. Observations proved that the air of forests at the same temperature

held more moisture than in the open field. notwithstanding the equal degree—generally 5 per cent. more, and in summer 9 per cent. more—and a falling of the temperature will condense more moisture in the forests. They make, therefore, the climate more humid, especially in summer and in more elevated positions; for, if in the open field 100 parts of water evaporate, the uncovered soil of a forest exhales but thirty-eight parts, and, if such soil contains leaves, moss, or a covering of vegetable earth, but fifteen parts of water. And Professor Ebermayer comes to the same conclusion as Mr. Wex, councillor of the court of Vienna, that the decrease of forests corresponds with the decrease of springs and of the depth and quantity of water in the great continental rivers. The foliage of the trees breaks the violence of wind and rainfall, the rain reaches the soil more gradually, and the generally spongy nature of the soil retains most of it for a lengthened time. Mr. R. L. J. Ellery, F.R.S., Government Astronomer of Victoria, says:—"From carefully-conducted experiments it is found that the temperature of trees in forests has a very different march from that of the air, for while the maximum temperature of the air is usually reached at 3 p.m., that of a forest tree occurs about 9 p.m. Days are cooler, nights warmer, than in open country. The extensive dryness of the untimbered country undoubtedly engenders meteorological conditions unfavorable to rain precipitation. In forests evaporation from the surface is greatly retarded, and is also going on from the leaves, tending to coolness, and an air saturated with moisture, which, if drifting into this cooler atmosphere, frequently becomes converted into a falling mist or actual rain. Rain may not fall, but the mist causes a continual drip from the trees, which cannot be measured in rain gauges, and yet the amount of moisture thus condensed by the trees and sent to the ground is very considerable. The distribution of the rainfall is of more importance than the yearly rainfall. In Orissa, with 60in., there occur yet terrible famines, for the heavy falls at one time are followed by aridity." Large portions of Cape Colony, Transvaal, and Natal were cited by Forester C. Mudd as being under a curse since their forests were cleared by the Kaffirs. He also refers to the bad effect of the clearing of a mountain range between Christchurch and Port Lyttleton, New Zealand, which fed five creeks with perpetual streams, but in 1887 there were already five months out of the twelve with not a drop of water in them. Mr. de Rinzy also states that the rainfall, which before had been 400in. in mountains parallel with the coast of Bombay, 40 to 150 miles inland, fell to under 100in. after the cutting of the forests on them; but after re-planting it was in 1886 again 200in. He thinks also that trees serve as points of electrical discharge from the surface of the earth, to which is due their power for increasing the rainfall in a district.

In a perfectly dry atmosphere, such as we notice so frequently in our Far North, the earth will exhale, as in the Sahara, in one night, all the warmth received during the day, and even in summer there may be a fall of the thermometer to freezing point. "Remove the moisture from the atmosphere of England but for a single night," says Professor Tyndall, "it will inevitably destroy all plants which frost would kill; for moisture is the principal distributor of warmth over the whole globe. Without it in the atmosphere it would be excessively hot in some countries and as cold in others."

Any intelligent person considering such observations and our necessities for a timber supply should agree with the late Baron von Mueller and other witnesses examined by the Victorian Royal Commission on Vegetable Products that the proportion of forest land to rural land should be in the proportion of 1 to 4 or 5. Whatever may be the direct effect of trees on the increase of inches in the rainfall, a greater number of showery days and heavier dews is certain to occur, when little or no evaporation takes place, and the rain soaks into the ground instead of running to waste. The leaves exhale a beneficent

vapor, and will increase the humidity and equiformity of the climate, which is nowhere more required than in our northern districts. The want of shelter is very great in many plains, so that, as Mr. Thompson once said, "The wind was at times so strong that the sheep had to hold on by the tussocks!" Nature invariably avenges reckless disregard of her laws, and only half-hearted measures will lead here as little to good results as elsewhere. We have an advantage over most European countries in our Eucalypti, that grow more rapidly than most timber trees, and in planting forests of them we may regain for the farmer of this State some of the hundreds beyond Goyder's line of rainfall, which, although blessed with fruitful soil, have apparently to be abandoned by them.

There are not a few who think that it is lost labor to attempt to plant forest trees in our Far North, which formerly had only a few timber trees in the creeks. No doubt it may require much patience, expense, and skilled labor to make a start, so as to protect further plantations; but we should not give in on that account. It is difficult for me, without actual experience, to advise what might be planted with the greatest probability of success in the north, and with the greatest profit in the south, or the hills of the State. It is almost too good a report that a farmer on the Willochra Plains had, four years after planting them in the centre of a paddock, sugargums 30ft. high. I saw myself those grown by Mr. J. H. Angas, near Clare, and by the late Mr. E. Bradtke, at Mannanarie, both of whom obtained the now repealed grant of land orders for successful planting. The trees were 50ft. and more high, but there could be hardly a question about the suitability of the localities for tree-planting. Mr. Bradtke, however, had absolutely to give up any further attempts with coniferous trees at Mannanarie. Mr. A. T. Noll, of Quorn, mentioned in 1899 that he had nearly 2,000 trees, viz., sugargums, pepper trees, tamarisks, mulberries, and olives, growing in an avenue of three rows, over a mile long, along a road adjoining the Quorn park lands, of which some were seven years old and 20ft. high. He had ploughed 6in. deep, pulverised well and watered the first year, and sheltered them with a broom bush against frost or excessive heat. He now informs me, in a letter of 2/11/1901, that he has lost a good many of these trees during the last two dry seasons; even some 10ft. to 15ft. high have gradually died off, and many more are sickly, through being probably too close or the subsoil in some parts not suitable. Those on the sandy red soil, with a good clay bottom, look well; while those on rich, dark, and loose soil, with limestone subsoil, are more delicate. Grasshoppers and rabbits are of course a great danger for any new plantation. Mr. J. McLachlan, M.P., planted 11 acres of ploughed ground with thousands of sugargums, at near Owen, on a limestone rise, and they are from 14ft. to 40ft. high. Mr. T. Casley, of Mount Remarkable, stated that sugargums grew near rocks where you would not think anything would grow. The late Mr. J. Ednie Brown, formerly our Conservator of Forests, said also that sugargums are the best trees to grow in dry, and particularly on limestone, country, where most other eucalypts would soon die. But, in accord with European experience, he also said that trees would grow better upon the virgin open plains than in the old denuded forests. The number of trees suitable for forests in South Australia, mentioned by the late Mr. J. E. Brown in 1881, is larger than the list which our present Conservator, Mr. Walter Gill, F.L.S., gave us in our *Journal* some years ago. But the former had then but five years' experience, and generally took optimistic views. Mr. Gill recommends the planting of *Eucalyptus rostrata* (redgum) and *Populus fastigiata* (Italian poplar) where there is a good rainfall; *Euc. leucocylon* (S.A. bluegum) and *Euc. corynocalyx* (sugargum), even for mallee lands, where there is a fairly retentive soil; *Pinus insignis* (Remarkable pine) and *P. halepensis* (Aleppo pine) for some of our northern reserves, and better still

at Mount Gambier; *P. halepensis*, with *P. pinea* (stone pine), and *Ailanthus glandulosa* (tree of heaven) for limestone country; and he states that *Robinia pseudo-acacia* (white acacia) and *Tamarix gallica* (tamarisk) are the best for making ordinary firewood in mallee country. He condemns *Euc. viminalis* and *Euc. globulus* (Tasmanian bluegum). Mr. J. E. Brown recommended the latter, the several *Araucaria*, *Cedrus*, *Cupressus*, many more *Eucalypti*, and pines and oaks, &c.

But while it may be wise that Mr. Gill recommends so few trees as suitable, it must be yet of some value to give the latest experience in the driest forestry sub-station at Santa Monica, in Southern California. We have the assurance that it is possible to grow there many more of our *Eucalypts*, where rainfall and temperature are not very different from our own northern lands, and, as regards the former, sometimes worse. At Santa Monica the rainfall was in 1897-8 only 5.2 in., and no rain at all in November and December. Cereals were a failure, but every effort was made to keep the plantations in good growing condition by thorough cultivation of the soil, and (a strange proceeding) many limbs and even tops of the large trees were heavily thinned to reduce their drawing on the soil moisture. For five years the average annual rainfall was 10.32 in., including an abnormal year with 16.13 in. The temperature was, as regards frosts, sometimes very trying, as low as 31° and 33°, especially at the colder creek level, where the nursery is located for convenience of water. The maximum of heat was 98°. *Euc. globulus* (Tasmanian bluegum), which with 20° to 22° of cold was killed in the Chico forests, is at Santa Monica used as shelter plantations; *Euc. rostrata* (redgum), *Euc. tereticornis*, and *Euc. stuartiana* grew, when two years old from seed, to averaging 7 ft. to 8 ft.; *Euc. gonicalyx* up to 14 ft.; seven-year old redgums measure 45 ft. in height, and 10 in. in diameter of trunk; *Euc. tereticornis* measure 55 ft., and 9 in.; *Euc. coccifera* and *Euc. cornigera*, which latter is the most antiseptic, are reported as especially hardy. The forester wants, however, solid blocks of several hundred trees of each of the sixty-four species of *Eucalypts* now grown there. The relative rate of the growth of the several species would in that case be of greater value, and more reliable. *Euc. viminalis* and our *Euc. obliqua* (stringy-bark), cannot stand there much drought, while *Euc. rostrata* (redgum) is found to endure extreme heat and drought, and resists frosts better, so that the forester recommends it for general planting. *Euc. corynocalyx* (sugargum) is also doing well, and *Euc. cornuta* (the yate of south-west Australia), which has a wood equal to ash for toughness and elasticity. *Casuarina glauca* (desert sheoak) grew, after being planted out when 1 ft. high, in one year to from 5 ft. to 7 ft., and the next year to 12 ft. It endures considerable drought. *Myoporum laetum*, from New Zealand, is an excellent shade tree, and withstands exposure and drought well. *Fraxinus velutina* (ash of the arid south-west), has proved valuable for dry localities, and still better with irrigation.

It may be advisable to plant chiefly Australian trees, for it is quite true what Dr. John Clifford, of the New York College of Forestry, says:—"The *eucalypts* are perhaps the most rapid growing of all trees." Even in Cuba the planting of them has proved a great financial success, and the farmers in South Africa call our redgum, because of its usefulness, the "farmer's friend." Suitable or unsuitable position has, however, a considerable influence on the growth and also on the value of the timber. Redgum favors the frequently submerged lands along the River Murray is said to be full of flaws filled with resin. Mr. Gill does not appear to find this any great objection, and I hope that his proposal to reserve this largest, most continuous, and valuable area on the banks of the Murray can be carried out, the more so as natural regeneration will there supersede planting under most favorable circumstances. Timber grown artificially in a suitable position and soil, and attended to, is generally superior to

that growing naturally. The strength of many of our timbers is most remarkable, especially our bluegum and blackwood. The Timber Board at the Victorian Railways Workshops, Newport, records from samples 7ft. long by 1½ in. square, upon bearings 6ft. apart, that the average specific strength of blackwood, grown in more elevated localities in Victoria, and taken from trees of about 3ft. diameter, was 2610, and the total average breaking weight 956 3lbs.; of ironbark (*E. sideraphloia*), 2854 and 1045·6lbs.; S.A. bluegum (*E. leucoxylen*), 2598 and 951·67lbs.; jarrah (*E. marginata*), 1982 and 726·1lbs.

Before mentioning the trees that I think might be planted I may remark that, with a view to influence the climate and the moisture, it will be of more advantage to plant evergreens, or at least to intermix them freely with trees shedding their leaves. The moisture in the air and mist may thus be better retained and dropped into the spongy soil which will form below.

From our wettest districts some of the willows (*Salix* sp.), and also the ash (*Fraxinus excelsior*), would soon give timber to coachbuilders. The American ash (*F. americana*) is said to grow well (?) at Horsham, in Victoria. For districts with a good rainfall I recommend redgum, the several poplars—which in Europe do well in the most open and exposed positions—the cork elm (*Ulmus suberosa*), carob trees, the plane tree (*Platanus acerifolius*), blackwood (*Acacia melanoxylon*), sheaoak (*Casuarina quadrivalvis*), and the oak (*Quercus robur*). There is also a probability that *Catalpa syriacaefolia*, the yategum (*E. cornuta*), with its durable, tough, and elastic wood, as well as the ironbarks (*E. sideraphloia* and *E. sideroxylon*), will do well in the hills near Adelaide, together with walnuts and chesnuts. It seems to me more doubtful whether jarrah (*E. marginata*), the Californian redwood (*Taxodium semper-virens*), and the camphor tree (*Laurus camphora*), will grow to advantage there. The latter grows fairly well at Hindmarsh Valley. Although Mr. W. Fergusson, the Victorian Inspector of State Forests, believes that the valonia oak (*Quercus aegilops*) and the cork oak (*Q. suber*) will grow in the Victorian northern plains, I have not seen them here, even at Mount Lofty, grown to much advantage. I have yet to mention our native pine (*Callitris robusta*), the sugargum (*E. corynocalyx*), the pepper tree (*Schinus molle*), the Aleppo and remarkable pines (*P. halepensis* and *insignis*) as doing well in most localities. The last-named gives certainly good timber for packing cases and butter boxes, as being quite free from resin, but whether good for railway sleepers, as stated by the late J. E. Brown, seems doubtful. Forester C. Mudd, in fact, condemns its timber—even for firewood—as being too difficult to work. At all events it must be planted close together to check the growth of laterals and thus to prevent the formation of knots, which are said to become very prominent after the shrinking of its timber. And let me here remark that the cutting of any timber trees should be done at the end of summer when the circulation of the sap has stopped. It is best to then remove the bark, but let it lie for some days with the full top on. The leaves, or the needles of pines, will then draw the sap from the trunk and exhale the moisture as if still growing.

T. Heins, Sons, of the large forest nurseries of Halsterbek, in Holstein, Germany, recommend two other kinds of pines as drought-resisting—these are *Pinus banksiana*, and *P. rigida*. The former is quick growing, even in such poor soils as the sandhills near the sea, and Professor Dr. Mayr states that, although fifty-five days after planting no rain fell, not one tree died. *Pinus rigida* also can stand much heat, but no frost, and is lately much used in exposed positions for shelter plantations. It throws more needles than other pines, and thus improves the soil.

The list which I have given above should be considered merely as a help. Persons of equally good or better judgment will probably not agree in every instance with it, but these trees can withstand more or less unfavorable con-

ditions, are mostly of rapid growth, have a long life, although useful also at an earlier date. Especially if mixed they will show beauty of form, give abundance of shade—even when planted here and there in arable land which at times is used for pasture—make an Australian forest a delightful retreat, and will afford much pleasure to owner and others as adorners of the landscape and windbreaks.

PICKLING SEED WHEAT.

The following remarks, made four years ago by Professor Lowrie, on the subject of bunt in wheat, are worthy of re-publication, as they contain practically all that needs to be said about this important question:—

“Last season a very large quantity of wheat was more or less damaged in the colony by the presence in the crop of bunt or stinking smut. This may occur (1) from carelessness in pickling, (2) inferior quality of the fungicide used, *e.g.*, impure or adulterated bluestone, (3) using a solution not sufficiently strong. If the seed be carefully pickled with a solution of bluestone, using from 6ozs. to $\frac{1}{2}$ lb. to the bag, very little bunt will be found in the crop. Of course the pickled wheat must not again be contaminated by being placed in bags in which has been bunted grain. Bags should, indeed, be steeped in an extra strong solution, or boiled in water. To dry the pickled wheat with a sprinkling of air-slaked lime is a good practice. Chemical reaction takes place between the copper sulphate and the lime, resulting in copper hydrate, basic copper sulphate, and gypsum, and the copper hydrate so obtained adheres better to the grain and is efficient against the mycelium of spores for a longer time after sowing, since it is not washed off by the soil moisture as is copper sulphate. Instead of working roughly with $\frac{1}{2}$ lb. bluestone to the bag it is better to make a solution of definite strength and steep the grain therein for a short while—1lb. of bluestone to 10galls. of water is 1 per cent. solution. I use this strength when there is no evidence of bunt in the seed, and stronger proportionately as evidence increases up to 2 per cent. To dry with quicklime makes the seed difficult to run through the drill, and I therefore rarely treat it with lime. Here are some of the practices of other countries:—In Germany, Kuhn's method is much followed—The grain is steeped from twelve to sixteen hours in $\frac{1}{2}$ per cent. solution of sulphate of copper. This practice is severe on the grain and kills a considerable percentage of seed. In France Dombaste recommends the sprinkling of the grain in a heap with a solution of 8lbs. of sulphate of soda to 10galls. of water, turning the heap frequently during the process, and following this by turning the heap and dusting with about 2lbs. of quicklime powder to the bushel of wheat, so that the grains are regularly powdered. This treatment has been practised with much success in France. The following prescription has been recommended as less likely to injure the seed:—‘Immerse the seed in solution of 1lb. bluestone in 24galls. of water for twenty-four hours, and then put the seed for five or ten minutes into lime water, made by slaking 1lb. of good lime in 10galls. of water.’ The drawback to this practice, it will be noticed, is the time taken in the process.

“What is known as the hot water treatment was first introduced by J. L. Jensen, of Denmark, in 1887. The seed is immersed in water at 132° to 133° F., for fifteen minutes. This treatment has been found to kill the spores without endangering or injuring the seed. To ensure the maintenance of the water at the desirable temperature (it must not fall below 130° F., or rise above 135° F.) it is well to have two coppers going in which water is maintained in one at about 120° or 125° F., and in the other at the standard temperature, 132° to 133° F. The wheat is dipped in the first to be warmed,

so that it will not reduce the temperature of the second while undergoing the scalding. The seed to be treated is placed in gunny bags or wire baskets; dip the bags or baskets for a few moments into the first vessel several times. This dipping and raising in quick succession secures the moistening of each grain, and the total time taken need not exceed one minute. Then plunge the bag or basket into the second copper, and let it remain there with an occasional agitation for fifteen minutes, regulating the temperature by pouring in hot water sufficient to keep the temperature at $132\frac{1}{2}^{\circ}$ F. Then remove it, plunge it into cold water, and lay out to dry. It is important to see that the quantity of hot water is several times the volume of the wheat immersed in it. This last method of treatment for bunt (stinking smut) has the advantage that it is much more efficient for loose smut than the bluestone method, and can be used with much success against the loose smut of oats and barley, while bluestone is far from successful. For oats Jensen recommends steeping for ten minutes, and spreading out at once to dry, thus neglecting the cooling in cold water."

FARM HINTS FOR MARCH.

It will pay well to maintain a paddock of good feed near to the homestead. In many places this can be secured by putting out plenty of the farmyard manure with a good proportion of super. or bonedust. If the farmer cannot provide a full ration of green feed for his cows, poultry, and other stock, he can at least do something towards it. During the next two or three months there is always a great deficiency of green feed, and the old dry feed is not very nutritious. A certain portion of the fallowed land might well be manured now and sown with rye, barley, mustard, rape, or with a mixture of the whole, to furnish early feed. A larger portion could profitably be sown later on with a mixture of many sorts, to be used for ensilage. It is well to sow some legumes with a crop meant for ensilage.

Paint all woodwork, clean, oil, and carefully inspect all ironwork in implements lately used in harvest work, and have any necessary repairs done at once. Put everything of the kind under shelter. Implements needed for preparing the land and for getting in the crops should be looked over and be in perfect order. It is too late to get such matters attended to on the morning when work should be started.

Weeds on the fallows are easily killed if turned out of the ground when the sun heat is great.

Put the cows with the bull now if they are wanted to come in whilst there is plenty of good feed.

Pigs for killing should be penned up now and fed only on grain or meal, with as much skim milk as can be allowed.

If it is possible grow some peas on some of the land that was cropped with grain last season. The land should be prepared soon and manured with a good dressing of potash and phosphate. Ordinarily very little nitrogen is required, but if this is deficient a small quantity may do good at first. If the fertiliser can be put in with the drills a dressing with 5cwts. per acre of a fertiliser costing £2 per acre and containing 8 per cent. water-soluble phosphoric acid, 11 per cent. potash, and $1\frac{1}{2}$ per cent. nitrogen will give happy results. Garden peas might as well be sown, because early crops bring good prices. Two bushels drilled is about the smallest quantity of seed, and it will be best to sow dwarf varieties. Lime is a necessary item where peas are to be grown. Do not sow until after some good showers have fallen.

Prepare land in suitable localities for sowing with grasses, clovers, &c., next month. Volcanic and loose friable soils do not need deep cultivation if weeds can be eradicated.

Farmyard manure should be carried on to the land and spread as soon as is possible. Of course it will be all the better if it can be turned under, but directly the dung is dry the waste of ammonia stops, and there is not much loss during the three or four weeks that may elapse before it is ploughed under.

In suitable localities a few rows of potatoes may be grown, and some parsnips and carrots sown, but the main crops of the latter two should be sown in drills later on.

In a sheltered place make a nursery bed, and sow seeds of Jersey kale, Drumhead and other cattle cabbages, for planting out when the rains come. Get some land well worked and heavily manured, in lines 6ft. apart, for reception of the plants.

If there is any feed about, and it is intended also to sow for feed, it is desirable to secure as many sheep now as may be wanted. Every farmer should maintain at least a few sheep. Turnips, rape, mustard, &c., grow quickly and provide good food for sheep.

Secure seed wheat at once. A large proportion of it should be rust-resistant. There are several varieties that possess this property and are not flinty, but are of good milling quality and good yielders.

When purchasing fertilisers remember that the man who sells is bound by the Act to give with each lot a statement of the actual quantity of water-soluble and acid-soluble phosphoric acid in it, as well as of the other matters, and this is to be regarded as a guarantee.

Prepare land for planting with a number of forest trees, to act as a wind-break. At least six rows, at 6ft apart, should be planted. The young trees must be protected against trespass by stock.

Lucern should be sown during this and next month on deep, level, well-prepared land. Seed should be drilled in half an inch deep, and land rolled soon after. The finer the tilth the better for the starting of the seed.

DISCOVERY OF MINERAL PHOSPHATES.

Mr. H. Y. L. Brown has reported to the Minister of Mines on his inspection of the phosphate discoveries on Northern Yorke's Peninsula. The following is taken from his report:—"The localities where the discoveries have been made are on sections 348, 349, 350, 351, 356, and 357, hundred of Clinton. They extend from two and a half miles to three and a quarter miles in a direct line north from Port Clinton, on Gulf St. Vincent, which is the nearest shipping place. The phosphate rock has been opened up and quarried to a small extent at four places, which are known as Nos. 1, 2, and 3 quarries and Baker's Gully, and exposed by cuttings and shallow excavations at numerous other places for a distance from north-east to south-west of one and a quarter miles. The existence of phosphate beneath the soil is indicated by scattered fragments and blocks which have been upturned and brought to the surface by the plough at the time the land was under cultivation. Some of these fragments are white in color, whilst others are brown, yellow, and iron stained. They are often associated with iron ore and magnesia, fragments of which are also scattered on the surface. They are embedded with black earth, clay, loam, marl, &c., and occur in patches. The soil generally contains nodules and lumps of phosphate rock, beneath which lies the phosphate deposit in situ. This consists of soft yellow and grey clay, calcareous marl, and sandy clay, embedded in which are segregated, rounded, and bedded-like masses of phosphate rock. The rock presents considerable variety in appearance, being sometimes grey, white, and chalklike, reticulated with thin veins of denser composition,

and at others a compact yellow-grey and reddish-colored rock with cellular spaces of various sizes, causing the whole to have a brecciated appearance; and again compact and nodular. In places earthy manganese fills the cellular spaces, particularly in the case of the soft chalklike rock, which is also stained with iron oxide. The deposit as a whole has no regular stratification, although here and there appear traces of stratification, which, however, are not persistent. The strata in which the deposits occur are Cambrian limestone; walls of this primary limestone are to be seen in some of the excavations. These are in some places vertical and in others inclined, but dip generally at a much higher angle than the dip of the limestone strata; from this and other facts relating to the exposed portion of the limestone rock I am of opinion that at one time caves and fissures varying in extent were found in the limestone rock, and that at a later period these became filled with the phosphate deposit. With regard to the size of these caves and depressions, the evidence obtainable from the position of the outcrops of limestone point to them being large. At Baker's Gully, section 357, the surface soil has been removed from a distance from east to west of four or five chains, exposing the phosphate deposit beneath. The width between the limestone rock outcrop is about a quarter of a mile. At quarry No. 3, section 348, a vertical limestone wall is visible on the eastern side, and the deposit is not defined westward. At No. 1 quarry an inclined limestone wall is visible on the west side. Sufficient work has not yet been done to allow the surface area of the deposits to be ascertained. The depth to which the deposits may extend is unknown, the present shallow quarries are not deep enough to yield evidence on this point. Judging by the apparent width of the cavities containing the deposits it is reasonable to suppose that in some places the depth will be considerable. No fossils have been found so far in the deposits, and their origin can only be conjectured at present. My investigations lead me to believe that the quantity of rock containing a sufficient percentage of phosphate of lime to render it of commercial value is very large, and the configuration of the country is most favorable to the opening of quarries, whereby the rock can be raised cheaply and expeditiously, and shipments averaging 70 per cent. of tricalcic phosphate and less than 6 per cent. of iron and alumina could be easily selected. With regard to the analyses made several of the more argillaceous samples were found to contain hydrous phosphate of alumina instead of phosphate of lime. I am informed by Messrs. Barton and Phillips—the former being the discoverer of these deposits—that three parcels, totalling 103 tons of phosphate rock, have been disposed of for treatment at Adelaide and Wallaroo, and the following are the selling weights and percentages of the parcels as given:—No. 1, 49 tons, averaging 58 per cent. phosphate and 7 per cent. alumina and iron; No. 2, 50 tons, averaging 65 per cent. phosphate and 3 per cent. alumina and iron; No. 3, 4½ tons, averaging 61 per cent. phosphate and 2 per cent. alumina and iron. On section 405, five miles north of the main discovery, rock phosphate of lime can be picked up on the surface. This indicates the existence of a deposit here; but so far no work has been done. It is most probable that deposits of phosphate rock occur in other portions of this district where occupied by the Cambrian limestone."

BEE STINGS.—The painful effects arising from stings of bees, wasps, hornets, and other similar insects can be immediately stopped by rubbing the affected parts with spirits of ammonia, after scraping the stings off with the edge of a blunt knife. Do not attempt to pull the stings away with the finger and thumb, because the poison-bag has been torn off with the sting, and the pressure of the finger and thumb discharges the whole of the poison through the channel of the sting into the wound.

FERTILISERS FOR WHEAT CROPS.

BY W. L. SUMMERS, INSPECTOR OF FERTILISERS.

*(Continued from February issue.)***Gawler River.**

MR. F. ROEDIGER.

Land a sandy loam, fallowed first week in August, 1900, and sown on May 6 with 60lbs. Purple Straw wheat per acre. Land manured in 1899, with Colonial Sugar Refinery super. Land was in good tilth at seedtime, but dry, and some of the seed failed to germinate. The rainfall from seedtime to harvesting on December 6 was 10·50, the winter being dry and cold.

Results of Experiments.

No of Plot.	Manured with—	Cost of Manure.		Yield.
		s.	d.	
1	84lbs. Thomas phosphate, two months before seeding	2	9	18 0
2	84lbs. Thomas phosphate, with seed	2	9	19 40
3	84lbs. super.	3	4	19 58
4	140 lbs. super.	5	8	18 58
5	140lbs. Thomas phosphate	4	7	21 2
6	No manure	—	—	19 10

It will be seen that the best return is obtained from the plot manured with 140lbs. Thomas phosphate. The high return from the unmanured plot renders a comparison difficult, especially as Mr. Roediger states that but for one end being somewhat thin near some trees it would probably have given as much as any plot but No. 5. Although the season was rather unfavorable, the result from the unmanured plot is very good; much above the average of the district. It is very probable that by careful cultivation and manuring in past years Mr. Roediger has got his land into good heart, consequently the effect of the manure is not so marked. He states that the crop on each plot was of the same height, and a stranger would have had much difficulty in finding where the divisions were. On the ordinary crop the results were very similar; strips were left unmanured, and could only be distinguished on close examination. The high return certainly bears testimony to the skill and attention given to the land. What strikes one also in the returns is the position taken by Thomas phosphate. North of Adelaide on sandy soils it is not, as a rule, a success; possibly the returns here are due to the fact that the sand is inclined to set, and when well prepared retains moisture well.

Morphett Vale.

MR. L. F. CHRISTIE.

Land a chocolate loam with limestone subsoil, manured in 1898 with bone-dust at rate of 1cwt. per acre, fallowed in July and August, 1900, and sown with 6 pecks Dart's Imperial wheat on June 15; tilth was almost perfect, but ground was very wet at seedtime. A dry spell followed, and the season altogether was the driest ever experienced here. All the plots were more or less affected by ravages of "grubs," but, with the exception of No. 5, which

was half destroyed, Mr. Christie thinks there was little, if any, difference in the damage on the different plots, and the results can be accepted as a fair test for a dry season.

No. of Plot.	Manured with—	Cost of Manure.	Yield.
		s. d.	bush. lbs.
1	84lbs. Thomas phosphate, seventy-eight days before seeding..	2 9	12 11
2	84lbs. Thomas phosphate, with seed	2 9	11 45
3	84lbs. super.	3 4	17 45
4	140lbs. super.	5 8	16 39
5	140lbs. Thomas phosphate	4 7	*4 3
6	2cwt. United Alkali super.	9 0	13 0
7	2cwt. Chemical Works bone super.	10 6	13 0

*More than half eaten off by grubs; the portions not touched would have yielded at rate of about 10bush.

In this instance applying the Thomas phosphate beforehand shows a little better result than the same quantity sown with the seed, but mineral super. gives very much better returns. What, however, is most noticeable is that the heavier the dressing of manure the poorer the crop. Mr. Christie, however, states that with their average rainfall he is convinced the opposite would be the case. Both with Thomas phosphate and with super. 84lbs. per acre gives better returns than 140lbs. The balance of the section was manured at rate of 1½cwt. per acre and returned 1 ton of hay, but if saved for wheat would not have yielded more than 8bush. per acre. Strips between the plots manured with 2cwts. super. and sown with Algerian oats gave a ton of hay to the acre; while on the adjoining section, of no better quality land, prepared for seeding in a similar way, but not manured, the returns both for wheat and hay were superior to Mr. Christie's manured crop.

Normanville.

MR. J. CRAWFORD.

Land heavy dark clay, exceedingly difficult to work. Sets very hard and cracks when dry, and is very sticky when wet. The land was not fallowed, and had not been previously treated with manure. Plot No. 1 could not be drilled in early enough owing to the winter being so late, and this caused the other plots to be sown later than was advisable. Five inches of rain fell after putting in plot 1, and it was consequently impossible to secure a good tilth on the rest of the lands, plots 4 and 5 suffering most. The rainfall from seeding to harvest was 12.54in. Owing to the rust in the crops the plots were cut for hay. Mr. Crawford is of opinion that had the season permitted the plots being sown earlier the yields would have been nearly double:—

No. of Plot.	Manured with—	Yield of Hay.	Increase Due to Manure.	Cost of Manure.	Profit.
		cwts.	cwts.	s. d.	s. d.
1	84lbs. Thomas phosphate, two months before seeding	40½	26½	2 9	41 0
2	84lbs. super., with seed	44	29	3 4	45 11
3	140lbs. super.	40	25	5 8	38 1
4	84lbs. Thomas phosphate	33½	18½	2 9	29 8
5	140lbs. Thomas phosphate	33½	18½	4 7	27 0
6	No manure	15	—	—	—

In estimating profit the Adelaide price of hay (35s. per ton) is taken. At Normanville it would be the cost of cartage less, and, as cartage will of course vary according to location, the Adelaide price is taken to afford a fair means of comparing results. It is very unfortunate that the heavy fall of rain about the end of May should have interfered with this experiment. From a personal inspection of another crop of Mr. Crawford's on the same hill, which was put in a little earlier, I am convinced that his estimate of the loss through delayed seeding is not far out. The difficulties of dealing with this class of land are great. To get a good tilth it must be well worked when it is fairly moist; when dry it is nearly impossible to get a plough in, and when thoroughly wet it is like glue. Under these circumstances a late winter renders the work of cultivation very difficult.

It will be seen from these figures that the most profitable result was secured from the use of 84lbs. mineral super., which actually returned more hay per acre than $\frac{1}{2}$ cwt. additional of the same manure. Under average conditions the heavier dressing in this locality would probably give a larger return. It is unfortunate that the wet should have interfered with the results. It will be seen that plot No. 1 was nearly as good as plot 2, yet 4 and 5, with the same manure, were much inferior. An adjoining crop, put in earlier and manured with Thomas phosphate at the rate of 1cwt. per acre, yielded over three tons per acre. The contrast between these crops and the neighboring ones, some of which was manured with super. and some unmanured, was marked. There is no question that on the heavy lands on this locality Thomas phosphate is a profitable manure to apply.

Port Elliot.

MR. J. BROWN.

Loamy clay soil, sown on July 13; cropped previous year with wheat. Manured three times previously with guano and once with guano super. One bushel per acre of Purple Straw wheat sown. Land in good tilth at seeding. Season very favorable until November 24, when hot winds did a lot of damage to crop. Red rust was also bad, and the yields from the plots were only about one-third of what was expected.

Results of Experiments.

No. of Plot.	Manured with—	Yield per Acre.	
		bush.	lbs.
1	No manure	5	0
2	168lbs. Thomas phosphate	7	1
3	168lbs. mineral super.	6	54
4	168lbs. Chemical Works bone super.	7	56
5	100lbs. Chemical Works bone char. super.	6	51

In actual yields bone super. has given best results, but the red rust had such a disastrous effect on the crop that it is doubtful whether the returns are of value for the purpose of comparison. The hot winds also affected the crops, and plots 1 and 2 being fully a week behind the others, were not so much injured, though equally as much affected by rust as the other plots, which promised much heavier yields. Mr. Brown reports that plot No. 2 had nothing like so much straw as Nos. 3, 4, and 5, but the yield of grain was proportionately better. Generally bone super. give satisfactory results in this locality, and these experiments add further proof of its value.

Mount Gambier.

MR. J. C. RUWOLDT.

Black volcanic soil, under potatoes in 1900, in grass in 1899, cropped with barley and manured with bonedust (except plots 8 and 9) the previous year. Seventy-five pounds White Tuscan wheat was sown on June 24, crop harvested on December 9. Altogether the season was very fair, but rust was bad.

Results of Experiments.

No. of Plot.	Manured with—	Cost of Manure.	Yield of Hay.	Profit Compared with Plot 6.
		s. d.	tons. cwt.	s. d.
1	1cwt. Thomas phosphate, two months before seeding	3 9	3 10	loss 3 9
2	1cwt. super., before seeding	4 6	3 14	2 6
3	No manure	—	3 0	—
4	1cwt. Thomas phosphate, with seed	3 9	4 10	31 3
5	1cwt. mineral super.	4 6	5 0	48 0
6	No manure	—	3 10	—
7	1½cwt. mineral super.	6 9	5 4	52 9
8	1½cwt. Thomas phosphate	5 8	4 16	39 10
9	1cwt. bonedust	5 6	4 10	29 6

These results will make our northern farmers envious. The land is naturally rich, and the climatic conditions permit of a system of rotation of crops. The plots manured two months before seeding were not a success compared with the others, the weeds apparently getting first use of the manure, as these plots were more weedy than any of the others. In each of the three set of plots mineral super. gave a better return than Thomas phosphate; considerably in excess of the extra cost of the manure. The heavy dressings in both cases increased the returns, but only to a slight extent. Bonedust on land that had never previously received any fertiliser gave equally as good returns as Thomas phosphate on land that had on more than one occasion received bonedust. While the land is rich enough to produce good crops without manure, the returns show that even here the outlay on manures is distinctly profitable. Taking the return from plot 6 as a standard, plots 4 and 7 show increases from application of 3s. 9d. and 5s. 8d. worth of Thomas phosphate of 20cwt. and 26cwt. respectively. Plots 5 and 7 show 30cwt. and 34cwt. increase at cost of 4s. 6d. and 6s. 9d. respectively. Plot 9 shows increase of 20cwt. at cost of 5s. 6d. Mr. Ruwoldt states that the whole of the plots looked equal to 50bush. of wheat had the rust not attacked the plant.

Wandearah.

MR. C. E. BIRKS.

Mr. Birks reports that owing to the long-continued spell of dry weather in the early part of the season, the wheat went off badly. Good rains fell later on, but much of the wheat was too far gone to be affected. In a depression running diagonally across the plots the wheat made a fresh start, up to 25cwt. of hay per acre being cut in some patches. The effects of the season were so irregular that nothing could be learned from the results.

Meningie.

MR. T. W. R. HISCOCK.

Mr. Hiscock sowed the manures supplied on land ploughed late in the season, with the result that the crop was very weedy and poor. Under the circumstances no other result could be expected. It is absurd for farmers to suppose that the use of manures will do away with the necessity for good cultivation.

Summary of Results.

Name of Experimenter and District.	Manured with 84lbs. Thomas Phosphate Two Months Before Seeding	Manured with 84lbs. Thomas Phosphate.	Manured with 84lbs. Mineral Super.	Manured with 140lbs. Mineral super.	Manured with 140lbs. Thomas Phosphate.	Unmanured Plot.
	bush. lbs.	bush. lbs.	bush. lbs.	bush. lbs.	bush. lbs.	bush. lbs.
A. F. Noll, Quorn	3 0	3 15	6 23	8 29	6 47	—
W. Lange, Mt. Remarkable..	9 31	13 12	16 24	16 5	13 45	—
A. L. McEwin, Brinkworth	6 29	6 15	11 56	13 11	6 31	—
F. Roediger, Gawler River..	18 0	19 40	19 58	18 58	21 2	19 10
J. W. Vigar, Rhine Villa ..	12 27	15 5	13 20	13 24	16 23	11 20
W. Towill, Purnong	8 6	8 38	11 1	15 9	9 58	—
D. P. Thomas, Scales Bay..	2 4	2 1	3 16	4 12	2 43	1 13
L. F. Christie, Morphet Vale	12 11	11 45	17 45	16 39	—	—
	Hay. tons. cwt.	Hay. tons. cwt.	Hay. tons. cwt.	Hay. tons. cwt.	Hay. tons. cwt.	Hay. tons. cwt.
J. Crawford, Nora anville	2 0 $\frac{1}{2}$	1 13 $\frac{1}{2}$	2 4	2 0	1 13 $\frac{1}{2}$	0 15

In the above table only the results from the experiments carried out with quantities of manures as arranged are given. It will be seen that under most conditions it is not profitable to apply Thomas phosphate only eight or ten weeks prior to seeding; better returns are obtained by putting it in with the seed. This is probably due to the absence of moisture in the soil. Last season was very dry until about June, and there was so little moisture in the soil that the phosphoric acid in the Thomas phosphate would probably remain unchanged. To obtain any benefit from the early application of this manure it would be necessary to work it into the soil in spring or the early part of the summer while it is still moist.

Taking the results right through, mineral super. has given the best returns. This only bears out the experience of the farmers generally. The heavier dressings have not on the whole been so profitable as the lighter. The dryness of the season and the ravages of rust most probably account for this. On the heavier soils and those that retain the moisture well, Thomas phosphate appears to be profitable to use. As phosphoric acid in Thomas phosphate costs 4s. 5d. per unit as compared with 5s. 9d. in mineral super., it would be well worth trying whether the application of the manure on the fallow at any time between June and October will not give satisfactory returns. One hundred-weight per acre might be worked into the soil in the spring, and 56lbs. of super. applied with the seed to give it a good start.

SULPHATE OF AMMONIA.—The most successful results from use of sulphate of ammonia are obtained on soils containing plenty of lime. Professor Warrington, one of the foremost English authorities, states that this fertiliser cannot profitably be applied to land deficient in lime. The ammonium salts do not become available as plant food till they have been converted, in the soil, into nitrate of calcium; hence the necessity for lime in the soil. Nitrate of soda, on the other hand, is immediately available, and is quicker in action, though it does not last so long as sulphate of ammonia. The former is therefore more suitable for top dressings than the latter. The comparative results from these two fertilisers will depend to a very large extent on the character and previous treatment of the land, and upon the season. In dry seasons the nitrate of soda will usually give the best returns. While, on the other hand, sulphate of ammonia will probably yield better results in wet seasons or localities. The prices of the two fertilisers will, of course, largely affect the question of profit.

ANALYSES OF FERTILISERS.

Analyses of Samples of Fertilisers obtained by Inspector of Fertilisers.

Vendor.	Brand.	Water Soluble Phosphate.		Citrate Soluble Phosphate.		Acid Soluble Phosphate.		Nitrogen.	
		Guarantee.	Official Analyses.	Guarantee.	Official Analyses.	Guarantee.	Official Analyses.	Guarantee.	Official Analyses.
		per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.
Geo. Wills & Co.	United Alkali Co. Super.	36.0	38.0, 37.6	—	—	—	—	—	—
Do.	do.	37.0	39.0, 38.5	—	—	—	—	—	—
Clutterbuck Bros.	do.	37.0	39.0	—	—	—	—	—	—
Do.	do.	36.0	38.0, 37.6	—	—	—	—	—	—
Elder, Smith, & Co.	Packard's Super.	36.0	40.0	—	—	—	—	—	—
S. A. Farmers Co-operative Union	Lawes' Super.	36.0	39.2, 39.8	—	—	—	—	—	—
Do.	Ohlendorf's Super.	36.0	39.9	—	—	—	—	—	—
Do.	United Alkali Co. Super.	37.0	37.6	—	—	—	—	—	—
Australasian Implement Co.	do.	36.0	39.0, 38.5	—	—	—	—	—	—
Do.	Ohlendorf's Super.	36.0	37.3, 39.2	—	—	—	—	—	—
Do.	Shirley's Super.	36.0	40.0	—	—	—	—	—	—
Wallaroo Phosphate Co.	Wallaroo Super.	36.0	39.5	—	—	—	—	—	—
Norman & Co.	Cross & Co.'s Super.	36.0	37.7, 37.5	—	—	—	—	—	—
Do.	Reliance Super.	36.0	37.8, 39.2	—	—	—	—	—	—
F. H. Snow	Sheep Brand Super.	36.0	38.7	—	—	—	—	—	—
D. & J. Fowler	do.	36.0	38.7	—	—	—	—	—	—
Adelaide Chemical Works Co.	Mineral Super.	36.0	47.1, 38.6	—	—	—	—	—	—
Do.	Complete Manure	25.15	34.5	6.2	4.1	3.2	54.8	2.1	3.74
Do.	Guano Super.	15.3	22.6, 25.2	15.0	3.7, 3.9	3.1	48.0, 53.5	3.5	3.2, 3.64
Do.	Super B.	15.0	24.7	15.2	3.6	2.3	39.1	2.0	3.37
Do.	Bone Super.	20.2	16.2	9.8	22.0	5.5	44.7, 50.0	3.9	4.24, 3.9
Do.	Bally Bonedust	—	—	—	—	52.0	45.6, 46.9	4.23	3.8, 4.4
Do.	Bonedust	—	—	—	—	45.0	46.7	3.2	3.7
Excelsior Manure Co.	Farmers' Fertiliser	—	—	—	—	30.0	39.7	—	—
Crompton & Son.	Bonedust	—	—	—	—	44.5	44.7	—	—
Mehrtens & Co.	Bonedust	—	—	—	—	43.77	45.6	—	—
L. Conrad	Bonedust	—	—	—	—	41.12	46.7	—	—
Geo. Wills & Co.	Alberis' Thomas Phosphate	—	—	—	—	35.0	39.7	—	—
Elder, Smith, & Co.	Bilston Thomas Phosphate	—	—	—	—	39.5	44.7	—	—

WATER IN BUTTER—AN IMPORTANT FEATURE.

BY G. S. THOMSON, N.D.D., GOVERNMENT DAIRY INSTRUCTOR.

(Continued from January "Journal.")

Concluding the investigation into the percentages of water in butter, fourteen of the boxes were placed in the refrigerated chambers for an average period of six weeks, and at the expiry of that time were removed to the testing-room for one week and finally examined. These boxes comprised tests 1 and 3. The results obtained by this experiment are of considerable importance, and the question may be asked, "Does butter improve in the freezing chamber?" The following gives the points awarded for flavor in the practical examination:—

Test 1.

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.
First examination (max. points 50)	48	48	46	48	48	48
Second examination	49	49	49	49	47·5	48

The temperature of the chamber was kept at an average of 15° F.

Test 3.

	No. 11.	No. 12.	No. 13.	No. 14.	No. 15.	No. 16.	No. 17.	No. 18.
First examination	47	47	47·5	47	47	47·5	47	47·5
Second examination	48	48	48	48	48·5	48	48	48
Temperature of chamber	10°	10°	30°	30°	15°	10°	15°	15°

From the above examination, which was carefully conducted, there is evidence of the temperature being favorable to an improvement in the aroma of the butter, and I might venture to attribute this good feature to the chilling of the produce so soon after manufacture, and to the gradual thawing at the conclusion of refrigeration. Upon the first examination of the butter I noted a perceptible weakness in flavor, but considered this arose from the want of sufficient salt in some of the samples and in the treatment the butter had received in the course of production. It is apparent that the process of manufacture, varying proportions of water, quantities of dry salt and brine and preservatives, has caused little or no variation in the keeping properties of the butter; and, most important, the difference in chilling temperature has been without an evil effect. This has been already demonstrated at the depôt, and the results published in the *Journal*. It would thus appear that butter manufactured from pure and perfectly ripened cream will produce a quality able to withstand influences unfavorable to its keeping properties, while the butter from inferior cream will require to be treated with more salt and boracic acid, and chilled at a lower temperature. To illustrate this I had prepared from a quantity of mixed cream four boxes of butter containing 4 per cent. of salt and $\frac{3}{4}$ per cent. preservatives. The results, after six weeks of refrigeration, are as follows:—

	No. A.	No. B.	No. C.	No. D.
First examination	47	47	47	47
Second examination	45·5	45·5	47	46·5
Chilling temperature	20°	20°	10°	10°

There is good reason to believe that refrigeration will bring about beneficial changes in the quality of butter, and this may be shown in cases of produce affected with plant and cowy flavors, as well as those arising from bacterial life. In the case of fishiness, however, I have proved that the flavor is considerably intensified in the butter immediately after thawing, but I have not had an opportunity to ascertain what temperature is most favorable or objectionable to the taint. And further, I have demonstrated that butter entirely free from a foreign flavor has shown a marked fishiness after a period of refrigeration.

Before concluding I would recommend factory managers to study the preceding paper very carefully, and if further information is desired on any part of the subject that appears insufficiently explained, I will be pleased to offer every assistance at my disposal.

A few Points for the Factory Buttermakers.

1. Churn the factory separator cream at 0.5 per cent. acidity.
2. Churn at a low temperature in hot weather.
3. Wash with the coldest water.
4. Use a weak brine for a second washing.
5. Drain long in the churn.
6. Dry salt at the rate of 3 per cent., and use the best brand.
7. Work twice, but reduce your present speed of roller (see previous article).
8. Do not use more than 100zs. of preservitas to the 100lbs. of butter.
9. Where refrigeration is provided in the factory chill immediately after manufacture.
10. In thawing do it gradually.

TAINTS AND FLAVORS IN DAIRY PRODUCE.

BY G. S. THOMSON, N.D.D., GOVERNMENT DAIRY INSTRUCTOR.

(Continued from January "Journal.")

Rule 9. Freedom of Taint-causing Weeds and Plants from the Food of Milking Stock.—In many districts close attention is required to reduce the overwhelming growth of destructive weeds, and if possible to eradicate them from the land. The distribution of the stinkwort plant, for example, extends over a large area of country, and its bad influence is felt by flockmasters as well as by the dairy farmer. Throughout the State, and especially in the North, the wild mustard, cress, and turnip appear to flourish, and in the early months of our export trade the injury to the flavor of butter is considerable. A strong effort should be made to effect a clearance of these troublesome plants, selecting the smallest paddock on the farm to commence operations; and where there is good natural pasture a destruction of the flowering heads and stems could be made, thereby preventing the spread of matured seeds, which if left undisturbed would give rise to fresh plants in other parts of the farm. In cultivated crops, such as lucern, rape, and cabbage, trouble frequently arises, but there is no reason why the milk should be permitted to become tainted when ordinary precautions can be adopted. To prevent the occurrence of taint lucern and rape should be given to the cows in small quantities, and when fed immediately after cutting it is recommended to mix the lucern with dry fodder. In feeding cabbages I would draw the attention of suppliers to the possibilities of a bad flavor in the milk arising from the use of the stems, and to avoid risks I would suggest giving this food, as well as other of a taint-producing character, after the cows have been milked.

Rule 10. Skill in Ripening Cream and Churning it into Butter.—It is not desirable to elaborate on the ripening of cream and the making of butter, as factory suppliers are not expected to pursue this branch of dairying on anything but a small scale. Notwithstanding this fact, much cream-ripening is done on the farm, and it is here that a grave error is permitted to continue, to the detriment of the manufactured article and to the injury of manager and factory. The reputation of our buttermakers is dependent upon the flavor of the produce, and this great quality in butter is derived from the care and skill that has been devoted to the ripening of the cream. Such a responsible duty should only be entrusted to our painstaking and trustworthy factory managers. Much is to be learned by suppliers in the way of collecting cream. The customary practice, and one that is attended with evil consequences, is to run cream from the separator into the same vessel twice a day until a sufficient quantity is obtained for conveyance to the factory. Again, in the case where the number of cows is small, cream consignments are kept too long on the farm, and it is common to find that morning and afternoon collections are not thoroughly stirred, leaving layers of old and fresh cream in one vessel. It would be to the advantage of the supplier to use more vessels for this purpose, keeping them in a cool place, and by thoroughly mixing the collections of cream in one can the night previous to cartage to the factory fermentation would be better distributed, and a finer flavored and better keeping butter would be produced. What is also wanted is more frequent attendance of the suppliers at the factories, and if such were the case the quality of cream would certainly reach a higher standard.

Rule 11. The Use of Preservatives.—The use of powders sold for preserving dairy produce has become of very common occurrence. Of the compounds in the market some have marked preserving properties, and are useful only when employed in extreme cases; but it is well established that preservatives are added to milk and cream when a reasonable cause is absent. Suppliers are not aware of the injurious effects these so-called "harmless" salts and liquids exert on the value of milk for butter and cheese making, and in the case of preserved cream the butter manufactured never possesses the characteristics of the article made from a well-ripened product. To show how preservatives are used indiscriminately, I had analysed a sample of milk taken from a vat immediately before renneting, and found it to contain an exceedingly high percentage of boracic acid. The cheese made from the milk could not possibly be of good quality, proving that the practice is ruinous to the manufacturer. If suppliers carry out the recommendations given in this bulletin there will be little need for incurring the expense of preservatives, and the quality of our butter and cheese will be further improved.

The Separator.

We now take up a subject upon which I have written many times, but there appears good reason for repeating much that has been said. In carrying out the practice of separation successfully the farmer must take a number of conditions into consideration, and what would appear to be a simple branch of dairy work is in reality one requiring skill, care, and a full knowledge of its many requirements; and so important are they that a full explanation of each is necessary. In doing this the following headings will be considered:—

1. Solidity of foundation and working efficiency of separator.
2. Condition of milk and temperature.
3. Warming the bowl before separation.
4. Speed of separator and inflow of milk.
5. Practice of separation.
6. Thickness of cream skimmed.
7. The addition of water or skimmed milk at the close of separation.
8. Alteration of cream screw.

Rule 1 directs attention to a weakness that is of common occurrence, and where it exists even skimming will not be attained. Sometimes we again find that the parts of the separator are out of gear, and under such a circumstance variations in the cream returns cannot be avoided.

Rule 2. It is always recommended to separate milk immediately after it comes from the cow, and why this should be so much advocated is because of the following reasons:—

- (a) The milk is in a very fluid condition.
- (b) It is free from acidity.
- (c) The particles of fat are not in bunches.
- (d) The fat globules escape more readily.

In cold milk exactly the opposite to the above occurs, which at once explains the inability of the separator to accomplish clean skimming. In the summer time, when milk is kept overnight and separated by itself in the following morning, there is less fat in the cream obtained owing to a degree of acidity or sourness having developed, and an increase in the thickness of the milk. For this reason it is preferable to separate cold milk alone at a time when the weather is favorable to a good keeping quality.

Rule 3. To prevent cream from adhering to the discs of machines and centre of bowl, and escaping in the skim milk, it is recommended to run a small quantity of warm water through before the addition of the milk.

Rule 4. The speed of the bowl should not be less than the number of turns advised by the makers; otherwise the skimming qualities of the separator will be lowered. To prevent loss of butter fat in the separator milk the inflow must not exceed the quantity of milk that the bowl is capable of treating.

Rule 5. In separating, the operator should be particular to keep a continual flow of milk passing into the bowl, and not to stop or slacken speed because the receiver is empty. Arrangements should be carried out so that the receiver is never permitted to exhaust itself, and this will reduce the chances of loss.

Rule 6. The best results are got from cream of medium thickness; when too thick perfect ripeness is not well obtained, and losses in fat in the buttermilk are increased.

Rule 7. When irregular quantities of water or skim milk are poured into the machine at the close of working the percentage of butter fat in the cream will suffer accordingly. Care should be devoted to the addition of regular quantities of separator milk, which will prevent interference with the quality of the cream, and is also preferable to the use of water.

Rule 8. As all owners and those engaged in the working of separators know that altering the screw causes a variation in the thickness of the cream, it should not be practised except when there is a just and reasonable cause given.

(To be continued.)

ANTI-RUST.—Pulverised resin and lard. Melt the lard and slowly drop in 1oz. of the resin for each 1lb. of lard. Stir well all the time till mixed, and then occasionally until cold. A very little of this smeared on iron or bright steel will prevent the surface becoming rusty.

ACUTE TYMPANITIS, BLOAT (OR HOVEN).—A remedy very widely recommended is one to two tablespoonfuls of carbonate of soda in 1½pts. of water. Quicklime dissolved in water is also effectual. Liquid ammonia, 1oz.; colts water, 1qt.; essence of ginger, ½oz. is also recommended. If these remedies fail, then the stomach must be punctured midway between the haunch bone and the last rib. This is best done by means of the instrument known as the trocar, which fits inside a hollow tube called the canula, which is left in the wound until the gas escapes. A brisk cathartic, say, 1lb. to 2lbs. Epsom salts, 3ozs. of ground ginger, 1lb. treacle, and 1qt. warm ale should then be given.

A PINHOLE ORGANISM IN CHEESE CURD.

BY G. S. THOMSON, N.D.D., GOVERNMENT DAIRY INSTRUCTOR.

For a considerable period a complaint has been found in the condition of cheese curd before salting. The appearance of the curd has shown the presence of numerous small holes, and the quality of the cheese in some instances has been defective, imparting a bitterness in flavor at the time of sale. In the investigation of the cause I secured a small piece of pinhole cheese and made a bacteriological examination, being successful in isolating the organism and preparing cultures. My next step was to ascertain if the germ could live for any length of time in the whey, and this I demonstrated to be the case, proving that contamination can be attributed to neglect to clean the cans which previously contained affected whey. Further, I found that the organism may be conveyed to the factory when the utensils are not thoroughly scalded, and where cleanliness in the milking of cows and proper precautions against the infection of the milk on the farm are neglected. Further evidence will be found in this paper of the dangers of neglecting to adopt a sound system of dairy work, and again I will repeat that the success of the industry is dependent upon the supplier, and not upon the factory manager, as too frequently is believed. Additional proof is thus afforded that inspection, combined with instruction, and conducted on a sound principle will provide the greatest aid to farmer, manager, and factory.

How the Investigation was Conducted.

Plate 1 represents the sample of pinhole cheese. The first thing done was to cut the cheese with a sterilised knife, and by means of a sterilised platinum wire brought into contact with one of the holes a quantity of culture media was inoculated and a plate culture prepared (Plate 2). After the organism had developed into numerous colonies inoculations of liquid media were made until the pinhole organism was found. Plate 3 shows the bells of gas which were given off by the bacteria. In conducting this test agar was used and liquefied in a test tube, subsequently sterilised, and at a temperature of 120° F. the culture was introduced. At the close of four and a half hours from inoculation gas bubbles were noticeable when the tube was photographed. Further tubes were prepared, and it was noted that the gas bells appeared more numerous at the bottom of the tubes, showing the preference of the organisms for anaerobic life. The shape of the bubbles in the tubes at full size are convex, but they occupy a ball appearance when subsiding. Further observations were taken of the globules. Plates 4 and 5 represent smear and stab cultures of the pinhole organisms.

Milk Tests.—A quantity of fresh milk was procured. One half was heated to the scalding temperature of cheese curd, 100° F., and afterwards poured into two sterilised flasks. A preparation of the culture was then added, and the flasks placed in the incubator at 95° F. Two additional vessels were put alongside with the control samples. At the conclusion of thirty-six hours the inoculated flasks (Plates 6 and 7) were photographed, but in the other two no evidence of perforation was noticeable. A pint of sweet milk was now heated to renneting temperature, 83° F., and inoculated with the culture. A few drops of dilute rennet was then added and thoroughly stirred. The flask was then set aside in the laboratory, and at the expiry of thirty-six hours the top of the curd, which had risen considerably, was cut off, leaving a holey condition, as seen in Plate 8.

Curd and Cheese Test.—On a small scale a cheese was prepared from milk inoculated with the culture. Plate 9 shows a splendid illustration of the pinhole curd, and Plate 10 the condition of the cheese a few days after manufacture. In this report only a brief outline is given of the investigation, which, although not quite finished, entailed a considerable amount of work.

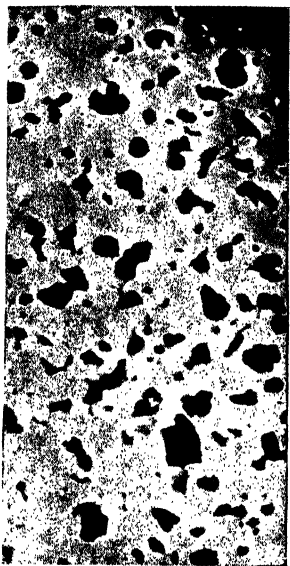


Plate 1.—Sample of “Pinhole”
Cheese.

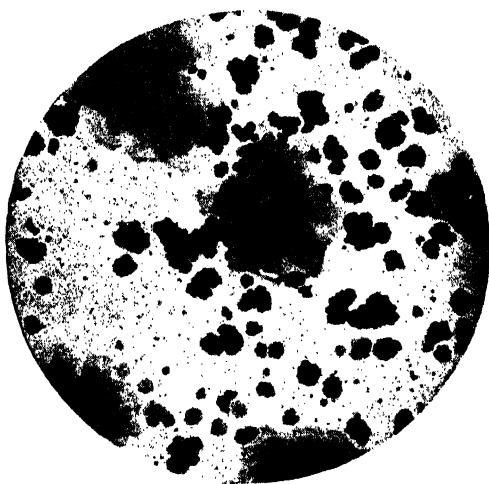


Plate 2.—Culture from No. 1.



Plate 3.



Plate 4.



Plate 5.

Tube, Smear, and Stab Cultures.



Plate 6.
Milk Inoculated with Culture.



Plate 7.
Milk Inoculated with Culture.



Plate 8.—Renneted Milk Inoculated with Culture.

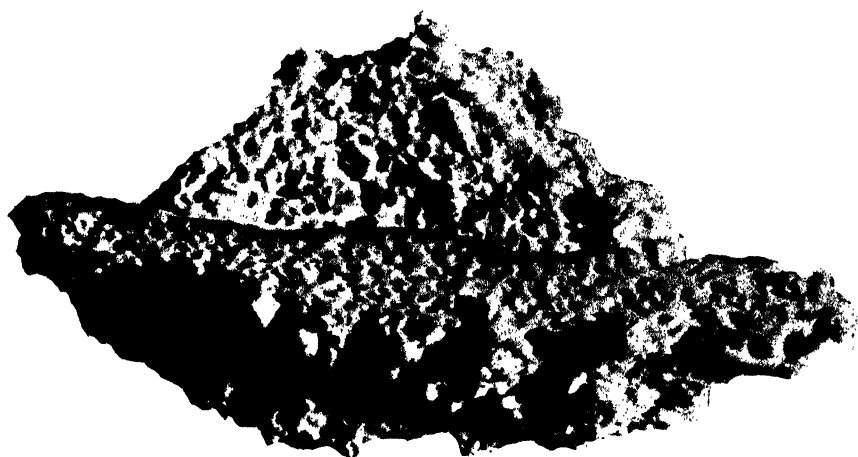


Plate 9.—Curd from Inoculated Milk.

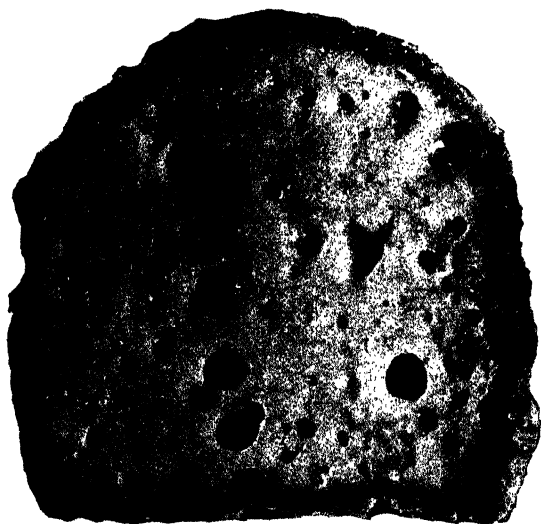


Plate 10.—Cheese made from Inoculated Milk.

POULTRY NOTES.

BY D. F. LAURIE.

NOTE.—Letters of inquiry, &c., should be addressed to me, c/o Engineer-in-Chief's Office, Adelaide, enclosing stamped envelope if reply required.

The Sydney correspondent of *The Austral Cultivist* reports the following importations by the State Government for the Hawkesbury College:—One cock and three hens Diamond Jubilee Orpingtons from Cook & Son, St. Mary Cray, Kent. One trio Brown Leghorns from Hurst, and bred from Palace winners and silver cup at Birmingham. One trio of Silver-grey Dorkings, the Hon. Florence Amherst's strain, and bred from Dairy Show and Crystal Palace champions. One trio Black Orpingtons. Cook's strain, the cock having won at several shows in England, and the hens are bred from Dairy Show and Palace Cup winners. One trio of White Leghorns, from Abbott Brothers, and bred from Dairy Show and Palace Cup winners. Pekin and Aylesbury ducks imported from America, and one trio each of Embden and Toulouse geese.

As I have before pointed out, New South Wales has a first-rate export trade in poultry, and such go-ahead action cannot but do much good. There is great need of education in poultry as well as other so-called minor industries. I hope before long to see something of the sort at our own Agricultural College. One hardly credits the enormous loss every year in grain shaken out of the ear. This might all be gathered by fowls and turned into money. Many a farmer's family is in poor circumstances which might be greatly alleviated if a fair number of the right class of poultry were kept in a proper manner. There are, of course, fairs where poultry will not thrive, nor does the farmer as a rule.

During my recent visit to Victoria I inspected Mr. G. E. Andrew's poultry farm near Ormonde, and was much struck with the many improvements and the magnitude of operations. The situation is admirable, being on a gentle slope facing east. The soil is sandy, and there is a grass which keeps green throughout the year. Shelter is provided by a number of magnificent pines, while in the yards there are numerous fruit trees, chiefly apples, and a few nice orange and lemon trees, all in full bearing and free from disease, &c. There were about 1,000 birds of various ages and of the following breeds:—*Langshans*, for which Mr. Andrew has long been famous. He has won numerous prizes throughout Australia, and the stock are everywhere. A hen recently bred by him and sent to England created a great sensation when exhibited; she won at Liverpool, the show of shows for the breed. As might be expected, I saw some remarkable specimens, especially some pullets, which promise to be something out of the ordinary, even for such a breeder as Mr. Andrew. *Wyandottes*.—Silvers, Golds, and Whites are in great evidence, and the most exacting can find many satisfactory specimens here. When it is remembered that Mr. Andrew spares neither money nor trouble in importing the best obtainable specimens, it is only what we may expect when such good stock is bred. Among a lot of young Silvers I spotted what is probably one of the best pullets bred in Australia. Judged on her present lines, I do not remember a better one, or one as good. Again in Golds, I saw some very promising cockerels and some wonderful pullets; while in Whites the quality was quite a revelation—the best I ever saw. The Wyandotte is a wonderful breed. There are varieties of it in sufficient colors to tempt and please any fancier, while the well-known utility qualities appeal to the judgment of the producer and breeder of utility fowls. There is a distinctive type for the Wyandotte, and all colors follow that. The different markings when bred to perfection make the bird one of the most beautiful we have. *Buff Orpingtons* are another special feature here, and most noticeable were some recently imported specimens of great merit. The Buff Orpington has many champions, who

claim for it that it is a good layer and a first-class table fowl. The white skin and flesh and the pinkish legs are much in its favor. It must be remembered that all buff-colored fowls take a lot of skill in breeding. The color is the difficulty, and unless care is taken the progeny soon become mismarked, bad in color, and very common-looking. Among a big lot of well-grown chicks of various ages I noted a big percentage of excellently colored birds, and no doubt, as in the breeds before mentioned, there will be many prominent winners from these yards at forthcoming shows. We saw a grand quartette of recently imported *Andalusians*. Mr. Andrew will doubtless breed a lot this season, and no one welcomes this fresh blood more than I do. The *Andalusian* is a great layer, and a handsome bird to boot. In Mr. Andrew's yards there are many miles of wire netting, while timber and weather-boards, galvanized iron, &c., represent hundreds of pounds. The workmanship is neat and substantial. As a rule the yards are close-timbered for 3ft. from ground, and then wire netting, so there is no fighting through the wires. Strength is needed, as foxes abound; and in addition Mr. Andrew is a noted breeder of high-class collies, and we all know what a few puppies would do with chickens if they had the chance.

Hatching is carried on by means of incubators as well as with hens. The hatching-house is a splendidly arranged building, about 50ft. long and 10ft. to 12ft. wide. A narrow passage runs the entire length of the house, which is divided into numerous compartments about 6ft. by 4ft., with glazed window, trap-door and ventilators to each, and a door opening to the passage-way. Each compartment communicates with a grass run wired in completely; here the chicks spend the first few weeks of their existence, and can be well kept and attended to in all weathers. There are numerous yards, but some are always unoccupied, as it is the practice to give all the yards a good spell in turn so as to sweeten the soil and grass. Mr. Andrew has paid much attention to incubators, and has tried many different machines. Those I saw were "Cyphers" and a new one, called "The Jubilee," which is in principle similar to one I designed some fourteen years ago for use with the electric regulator I at same time invented. Mr. Andrew was giving this a trial run. The regulator is a novel application of the well-known principle of the varying degrees of expansion in certain metals under a varying temperature. On the subject of poultry Mr. Andrew is strongly in favor of pure breeds. He disposes of a great number every year; to farmers a great many go as well as to breeders. In Victoria, as here, there is a strong movement everywhere in favor of improvement of breeds and methods. When the value of blood and the adoption of sensible feeding and housing are the order of the day poultry-breeding will rank in the first flight of industries.

Pure-Bred Fowls for Farmers.

The arrangements made last year with reliable breeders for supply of eggs to members of the Bureau at reasonable prices will be continued, and will probably be extended to the supply of young birds for breeding.

Last season several applicants for eggs could not be supplied. To those and others I may say that I can secure a few choice cockerels and pullets of Golden, Silver, and White Wyandottes, Black Minorcas, and Brown Leghorns; also a few good Minorca hens, young and in good order. I shall make up my own pens early this season, and hope that early hatching will be the order of the day. Wyandotte pullets, if hatched early, lay a lot of eggs at a time when eggs are dear; they also moult early, and lay during winter. I hope later on to have a good stock of the recently imported Old English Game, the finest of all table birds and good layers; also the Partridge Wyandottes, which will become most popular. They are very handsome, and have a great reputation.

NOTES ON VEGETABLE-GROWING FOR MARCH.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

The season, though interspaced with numerous cool changes, has been dry; consequently vegetable crops have not made the progress usually expected from them. Where a good pressure of water is available for the running of sprinklers fair progress has been made by cabbage, cauliflowers, turnips, &c. The setting out of cabbage, cauliflower, and Brussels sprouts will still be continued for the early crops on the plains. These are usually planted into well-moistened soil which has been richly manured. It is a good plan when working on a small scale to puddle the plants into position. This is done by making the holes with a dibber first. One person then passes along with pots of water, and from them fills each hole. A second person follows at his heels placing the plant's roots well down into the muddy water, and draws the surrounding soil into it and against the roots. After the rows are completed, the soil is pulverised all over, and more particularly around the plants, but no other immediate watering is applied. Where early frosts are not experienced, potatoes should be planted early in the month on the plains. The "eyes" should be started, but not protruding, and a few strong "eyes" upon each "sett" is preferable to a large number, the reason being that a few strong stalks yield finer tubers than many small spindly shoots. On most of our soils all of these crops benefit from a good sprinkling of bonedust or superphosphate being applied and mixed into the soil just before planting.

Celery should be put out in trenches now. Secure short sturdy plants and set them carefully in a trench, say, 18in. wide and 18in. deep. Plenty of well-rotted stable or farm manure should be mixed with the lower 9in. of soil, into which the plants are set. When preparing the trenches bank the good soil equally on each side of them. This facilitates future banking up for blanching the leaf stalks, and, should the weather prove unfavorable just after planting, the mounds may be utilised to support shading which may be spread over the plants.

Prepare ground and sow root crops such as turnips, parsnips, carrot, radish, and beet. Select if possible the ground which was heavily manured with organic matter a year ago, and which is now in a fine, free, loose, nutritious condition. Prepare it carefully at least 1ft. deep, and then sow the seeds in drills. After sowing cover them lightly with finely-broken manure.

Peas, broad beans, spinach (prickly), and parsley should also be sown under similar conditions, though these will all thrive on newly-manured land. Previous sowings may need weeding, and probably the weeds have outgrown the cultivated plants. In such a case the advantage of the drilling will be apparent. A line may be stretched or other means adopted to readily locate the hidden plants, and thus make a safe course for the hoe.

The sprouting peas are readily sought by sparrows. The best protection in small gardens is found in stretching black cotton—a single thread—along each row about a couple of inches above the ground. Before the wily sparrow overcomes his suspicions the plants are tougher, and he no further molests them.

Melons, cucumbers, and beans still like plenty of water. With care the latter may be carried on in good pod-bearing condition for some time. The writer has often kept dwarf beans in growth and fruitage until early peas were ready.

The early crops of the cabbage family should be watched for the appearance of the aphid or blight, and the green caterpillars, which make holes in the leaves. The first of the aphides are usually found on the under sides of the leaves in the crinkled spots; in fact, they intensify the crumpled leaf surface.

The holes made by the green caterpillar are first seen in small white patches. This is due to the insect eating away the green cellular tissue, and leaving only the film. These films quickly perish, and holes are formed. Frequently slugs are blamed for this, and the caterpillar in the meantime gets a strong hold. These early crops of cabbage and cauliflower are usually the most profitable to the Plains grower. They are, therefore, worth making an effort to save. The aphids may be destroyed by spraying with resin wash, made by boiling 10lbs. resin, 10lbs. washing soda, 5lbs. common soap in 10galls. of water. When all are dissolved, add water to make 100galls. for spraying. Two dressings given within a few days of each other will practically stop the progress of the pest, and save the crop. Kerosine emulsion will also kill the aphides, but it is more costly. The green caterpillars may be killed by the same remedies, but unless the cabbages have begun to form hearts the Paris green is more effective. If 1oz. of Paris green and $\frac{1}{4}$ lb. of freshly-slaked and sifted lime be used in 6galls. of water the spray is most effective. This must not be used after the leaves begin to fold in. It would be worth while where both aphides and caterpillars are present to try the combination of a little Paris green with the resin wash.

Cut and store pumpkins, trombones, and watermelons as soon as they mature. If tomatoes are densely foliaged cut out many twigs, to permit free access of sunlight, to assist in ripening the later fruits.

Cut away the yellowing stalks of the asparagus plants, but retain and encourage all that remain green. These assist to strengthen the crowns and roots for the next spring cuttings. Do not let rhubarb plants become too dry, but at the same time the plants should not be forced. They are gradually sinking to rest, and only require moisture in diminishing quantities. Keep all seed stems cut away as soon as visible, as these exhaust the plants.

In specially-prepared seed beds make successional sowings of cabbage, lettuce, cauliflower, kohlrabi, onion, for future plantings.

ORCHARD NOTES FOR MARCH.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

In the cooler districts the harvesting, storing, and packing of apples and pears will receive attention during this month. It is true that between non-setting, fuscladiums, codlin moth, and high winds the yield will be curtailed, and probably result in the shortest harvest for many years past. The utmost care is necessary in handling the fruits, and all specimens showing the outward evidences of codlin moth attack should be kept separate.

Some growers gather their apples into cases and allow them to stand for a few days in the shade, with the double object of more readily detecting the codlin moth-affected fruits, and to allow the excess of moisture to pass from the skins. There are many methods of storing the fruits in the storehouse. The system of storing apples in single layers is not practicable here, and, unless the temperature is regulated perfectly in the store, is not desirable. Stored in bulk layers a foot or more deep the fruits keep as well as can be desired if proper care has been exercised in sorting and handling. In such a bulk the apples most closely covered almost invariably come out in the best condition, those on the top being more or less wilted, flavorless, and tough. In the matter of storage accommodation much care is needed. The ideal house should be made so that an even temperature may be maintained. The nearest approach to this, at reasonable cost, is gained by having a semi-subterranean chamber, with doors and ventilators, which may be closed at will. One great consideration here in an apple store is the trapping of pests.

In spite of all care, some minute codlin larvæ, or eggs, may escape detection, and these secrete themselves in the interior of the house until the next spring. To meet this difficulty the inside of the house should be made so that no refuges in the shape of cracks remain for the larvæ to conceal themselves in. The fixtures should be adjustable, so that they may be cleansed when the fruits have been removed and before the insects reach the moth form. The apertures should be glazed or covered with material, which will prevent the escape of moths, and, better still, the whole structure should be readily made air-proof, so that when empty of fruit fumigation may be resorted to successfully. Pears do not keep so readily as apples when stored in bulk, and the softer the texture of the variety the less should be the pressure from above. In placing apples and pears in the store, always put the smallest and firmest specimens in the positions least accessible, as they will keep better and require less sorting than large specimens. This precaution should also be taken in placing the different varieties in the store. Stone Pippin, Nickajack, and Rokewood would need less attention than Rome Beauty or even Scarlet Nonpareil, more particularly if the latter sorts be above medium size. After the apples and pears are carried into the store they will throw off moisture, unless previously wilted. In such instances free ventilation should be allowed for a few days. After this the house should be kept close and dark. If it is desirable to ripen any kind rapidly they should be brought into a fairly well lighted position.

There are ominous signs on every hand that owing to the codlin moth pest the promise of a fine export trade in apples being established in this State may soon be a thing of the past. Should this undesirable result become more than a fear, the growers largely have themselves to blame. On the one hand there is the loud agitation from those but slightly interested—interested only in the production of a comparatively few cases for local market purposes, and on the other hand we have those who though largely interested in a pecuniary sense, have been very apathetic respecting their future prospects in this matter. Midway between these have stood the officials and a few discerning growers protecting the apathetic and bearing the whips and scorns of the agitating many. These conditions cannot last. Either the protectors of codlin moth must prevail, or the apple-growing industry progress. It is largely a matter for the growers themselves; that is if the authorities recognise in this matter *vox populi* to be *vox Dei*. In the midst of all the disputing on this subject it is refreshing to know that some growers, by adopting the remedies so often mentioned in these notes, have this season secured quantities of clean fruit, which will go a long way towards convincing them, at any rate, that some "good can come out of Nazareth."

It is to be hoped that those who pack apples for export will not descend to sending away apples of inferior quality because there is every prospect of good prices being obtained for top grades locally later on. It would be far better not to send at all. The future trade must be considered, however, and this outlet for our surplus stocks kept open without restriction or doubt. Because this season there is a shortage we should not be discouraged, as the output of each year is bound to be on the upward tendency.

The summer has not been favorable to the even ripening of grapes, more particularly raisin grapes. The removal of a few leaves around the bunches will admit light and warmth and assist in even ripening. The drying of Muscatels in the open air has been retarded by the sudden changes and protracted spells of cool weather. Small growers who dry for home consumption could overcome this difficulty by making racks to fit upon a kitchen stove. To such persons a hint respecting the gathering of grapes may be useful. Always allow them to become quite ripe and sugary. If such a course be followed the vines must be gone over at intervals to secure the ripe

bunches as they arrive at the proper stage. The largest grapes do not necessarily yield the best raisins, as they when dried may consist mainly of skin and seeds. When the bunches are cut the drying is facilitated by dipping them for a couple of seconds in hot lye at about 190° F. The lye should be made in the proportions of 1lb. caustic soda to 10galls. or 12galls. of water. A kitchen colander or a much-perforated kerosene tin makes a very good vessel for holding the bunches during this process.

If the sap is still active in the stock plants, buds could be inserted during the early part of the month. These should not be started, but simply induced to "take." Care will be necessary in loosening the ties of these late-inserted buds; otherwise as the top ceases to grow the sap settles back and increases the girth of the stock considerably, causing constriction, and probably death, to the inserted buds if the ties are any way tight.

Young citrus trees could be transplanted safely now if soil can be lifted in an unbroken condition around the roots. It is preferable to lift trees that are just about to make a start to grow. These will become established before the ground cools down in winter. All such trees should receive a good soaking as soon as replanted. After the soil has dried to a workable point pulverise the surface finely.

If time can be spared the old dead wood could be thinned out of orange trees, and if red scale is present this is a good time to spray the trees with resin compound, made by boiling 10lbs. resin (powdered), 10lbs. washing soda, and 5lbs. common soap (sliced), in 10galls. of water, then adding enough water to make up 50galls. of wash. A good dressing of this in March and another in April will not leave many scales alive. It is always desirable to give these trees a good soaking of water a week before applying the resin spraying.

Where it is necessary to fill up blanks in old orchards it is a good plan to take out a large hole now and leave the soil well exposed until the time for filling in with good compost arrives at the planting season.

As the summer heat declines we are liable to forget that the soil moisture is at its lowest supply. Although transpiration may be less rapid from deciduous trees and the oversight not be of very serious consequence, the case is different with evergreen kinds. The loquat pushes up its growths and prepares to continue them into flower spikes, and the citrus trees make their autumn growths and carry on their growing crops of fruits at the same time; consequently careful attention should be given to watering and fertilising these sorts.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Company report :—

March 1, 1902.

February well sustained the reputation of this summer, being the coolest experienced for many years past, and as we are now entering the autumn season the hot weather may be fairly reckoned as having passed. Climatic conditions having proved favorable to the vine crops, a heavy yield is now being gathered, though in a few places south the effects of the fierce hot storm in January is affecting their output of grapes and other fruits. Farmers now are beginning to hope for rains soon to ensure winter feed, and enable them to make an early start on preparation for seeding operations. Dry feed is fairly abundant, and no unusual scarcity of water is being felt.

Business, though a bit quiet, shows steadiness, and the commercial outlook for this State has improved somewhat through the partial recovery in values of lead and copper, which will very probably save the closing down of some mines that were discussing this step when metals were low and falling a few weeks ago. A strongly reassuring report on the Tarcoola Goldfield by our usually very cautious Government Geologist will probably have the effect of stimulating operations there, now that the cooler season is at hand, but the development of this field is largely dependent on the obtaining of a water supply in the neighborhood, of which, however, geologists speak favorably.

When writing last the European wheat markets were showing weakness, but this proved only temporary; a slight move up later occurring, though values subsequently eased back, so

that present quotations are on a par with rates at close of January. The tone at present is reported as being steady, though America at moment is weaker. The very mild weather now prevailing in the Northern Hemisphere confirms our impressions when last reviewing—that the winter season altogether has not been unfavorable for the young plant. At Australian shipping ports values for wheat have ruled above United Kingdom equivalent, Melbourne at times showing considerable activity at higher quotations than in Adelaide and Sydney. At the latter port it is said that a 20,000-bag parcel was with difficulty placed at 3s. 2½d., though shippers in Melbourne and Adelaide have had to give above relative values to fill charters; farmers' deliveries, in South Australia at any rate, continuing very light, which is making some authorities begin to question whether the yield here will nearly reach even the small average estimated. Only a moderate local trade doing in flour. Millers' offal has been scarce, bran and pollard advancing 1d., and only prevented from rising further because some buyers who had contracted early in the season were willing to quit at a modest profit.

In forage the demand outside of local is limited to a small export trade to Sydney in hay and chaff and a little business doing with Melbourne in Algerian oats and Cape barley. Values have sharply advanced in feeding grains, but fodder remains unaltered.

The market has been supplied chiefly with local potatoes for city trade, Mount Gambier grown filling up most country orders. Deliveries have been short of requirements, so that a few parcels of Victorians were brought in, but buyers still prefer the local raised. Values have advanced about 10s. a ton, and at moment display decided firming tendency. Onions have ruled even, and as reports from Victoria point to heavy crops being pulled this season, the extreme prices realised last and previous years are hardly likely to be repeated, though an advance of 10s. a ton has been secured during past couple of weeks.

A heavy business doing in dairy produce lines during February. As the local shortage in butter supplies became more evident increasing importations were necessary, so that, this market having to rely on the neighboring States for a large portion of its requirements, values here followed closely the movements in Melbourne, which has improved about 2d. during the month. The effects of the 6d. a dozen duty levied on eggs by the Commonwealth tariff is practically prohibiting importations to places in Australia that have in previous seasons been obtaining portions of their supplies from outside sources. This partly accounts for the higher rates this year, but the early Lenten season was also a factor in price advancing sooner than usual.

The supply of local cheese is barely sufficient to meet demand, and as stocks are known to be very light we must expect to see New Zealand helping to fill the wants of this market before our next season's make can be ready. There is quite a dearth of pigs throughout Australia, and bacon is likely to rule dearer than for years past. Even at present price of wheat, it will pay handsomely in many agricultural districts to feed the grain to good store pigs. Honey is in much better demand and at last this line shows a fair price established. Beeswax has continued very saleable. The new crop of almonds is reaching market and finding ready buyers, though price has eased down slightly.

The quantity of poultry coming to hand does not show any diminution, but during the past few weeks the quality has not been up to average, so that for poorer sorts price is not so high, but fit table sorts continue to sell at good figures, and the very healthy export trade established for eggs as well as poultry should encourage the production of these as being likely to rule at satisfactory prices, though, like every other commodity, subject to fluctuation of market.

MARKET QUOTATIONS OF THE DAY.

- Wheat.—Port Adelaide.—Shipping parcels, f.a.q., 3s. 2½d. to 3s. 3d., f.o.b.; farmers' lots, 3s. 2d. on trucks, per bushel of 60lbs.
 Flour.—City brands, £7 10s.; country, £7 to £7 5s. per ton of 2,000lbs.
 Bran and Pollard.—11½d. to 1s. per bushel of 20lbs.
 Oats.—Local Algerian and dun, 2s. 3d. to 2s. 6d.; prime stout feeding white, 2s. 8d. to 3s. per bushel of 40lbs.
 Barley.—Malting, 4s. to 4s. 4d.; Cape, 2s. 4d. to 2s. 7d. per bushel of 40lbs.
 Chaff.—£3 to £3 5s. per ton of 2,240lbs., bags in, dumped, f.o.b., Port Adelaide.
 Potatoes.—New locals, £4 15s.; Victorian, £4 17s. 6d.; Mount Gambiers, £4 7s. 6d. per 2,240lbs.
 Onions.—Local Spanish, £4 10s. per 2,240lbs.
 Butter.—Creamery and factory prints, 1s. 8d. to 1s. 4½d.; private separator and best dairy, 1s. 1½d. to 1s. 3d.; good store and collectors', 11d. to 1s.
 Cheese.—South Australian factory, 6½d. to 7½d.; New Zealand, 8½d. per pound.
 Bacon.—Factory-cured sides, 8d. to 8½d.; farm lots, 6½d. to 7½d. per pound.
 Hams.—South Australian factory, 9d. to 10d. per pound.
 Eggs.—Loose, 1s. 2d.; in casks, f.o.b., 1s. 3d. per dozen.
 Lard.—In bladders, 7½d.; tins, 7d. per pound.
 Honey.—3d. for best extracted in 60lb. tins; beeswax, 1s. 1½d. per pound.
 Almonds.—Softshells, 5½d.; kernels, 10½d. per pound.

Live poultry.—Good to heavy table roasters worth from 1s. 10d. to 2s. 4d. each: well-conditioned hens and fair cockerels, 1s. 4d. to 1s. 8d.; a few poor to medium coops, 1s. to 1s. 2d.; chicks, 6d. to 9d.; ordinary ducks, 1s. 6d. to 1s. 9d.; prime heavy, to 2s. 3d.; medium-conditioned geese, 2s. to 2s. 6d.; no quality catalogued; pigeons, 4½d. to 5d.; turkeys, 5½d. to 7½d. per pound live weight for ordinary to fair table birds.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, flour, and forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese.

MISCELLANEOUS NOTES.

POISONING FOXES.—Mr. David Bruce, of Canary Island, Pyramid Hill, writes to the *Australasian*:—"I have found the following a really effective way of poisoning foxes:—Get the kidney or skirt fat from a sheep, cut it into baits half the size of a hen egg, make a deep incision in each bait with a sharp knife, and put a dose of strychnine in the cut, taking care that none of the poison remains on the outside of the bait. I have always found the powdered strychnine the best. Then get a leg of mutton or sheep's head that has been well roasted, and drag a trail near the most likely places for foxes to be found. At intervals along this trail, holes about 3in. in depth are dug with a hoe, and one bait put in each, the earth being then returned. The trail can be any length, and the baits as far apart as one thinks desirable. The baits must not be touched by the hand. I have tried many ways of getting rid of foxes, but the one described has been most successful. On a trail four miles in length I once found eight dead foxes."

MIXED GRAIN CROPS FOR HAY.—For six years a very interesting experiment has been carried out at the Ontario Agricultural College with various grain mixtures for hay and for grain. Mixture containing two, three, and four different grains have been used; the experiments numbered fifteen each year, and were always conducted in duplicate, making 180 tests in the six years. The result of this extensive series of experiments showed that a mixture of barley and oats gave the most grain, and peas and oats the most straw. The oats and barley mixture was the most profitable. A test as to quantities and proportions of each grain per acre showed that the largest yield of grain was obtained by sowing 1 bush. of oats and 1½ bush. of barley per acre, and the greatest yield of straw from 1½ bush. each of oats and barley. Taking the result as a whole, the former mixture is considered the more satisfactory. Where grain is the object it is essential that the varieties used should require about the same length of time to reach maturity.

THE BOY ON THE FARM.—One of the great latter-day evils with which statesmen have to contend is the tendency to centralisation—to the massing together of the people in cities, and the consequent slump in farming. A contemporary humorously offers its services, and gives a little practical advice on the subject:—"The sure way to get the boy off the farm is as follows: If any errand is to be done, have the boy do it regardless of his being tired or not; if anything breaks or is lost, be sure to blame the boy; and if he shows any inclination to drive out like other boys, let him have the spavined horse for his use. If there is to be a literary meeting, have the boy do the chores and any extra work that has to be done, so as to let you go early and read your paper on the topic, 'How to Keep the Boy on the Farm.' When a fair is in progress, see that the boys have work to do while you go and compare notes with other farmers. When any stock is sold, be sure to use all the cash yourself. If you follow these suggestions his constant thought will be, 'Just as soon as I can after I am 21 I will try some other calling,' and generally it will be one of which he has no knowledge, and so he places himself far behind his associates in the new field he has chosen."

CONFERENCE OF BRANCHES AT CRYSTAL BROOK.

The Tenth Annual Conference of Northern Branches of the Agricultural Bureau was holden for this year at the Institute, Crystal Brook, on Wednesday, February 12.

Attendance.

The following Branches were represented:—Crystal Brook: Messrs. J. C. Symons, W. J. Venning, F. S. Keen, W. Natt, F. E. Fisher, W. Hamlyn, A. Hamlyn, R. Pavy, P. Pavy, E. Dabinett, J. Bryson, and L. Forrester. Koolunga: J. Sandow, J. Button, and E. Shipway. Caltowie: F. Lehmann. Wandearah: G. Robertson. Narridy: J. Darley and T. H. Smallacombe. Port Germein: G. Stone. Gladstone: C. Goode, J. Rundle, and W. A. Wornum. Redhill: D. Lithgow. R. T. Nicholls, and A. McDonald. Port Pirie: T. Johns, E. J. Hector, P. J. Spain, and T. A. Wilson.

Visitors.

From Central Bureau: Messrs. H. Kelly, J. Miller, M.P., W. C. Grasby, and the General Secretary. From School of Mines: Geo. Jeffrey (Wool Instructor). Also, Hon. A. Catt, M.P., E. Wilson (Inspector of Homestead Blocks), and about thirty others, many from distant parts.

Exhibits.

There was an excellent display of fruits and other products grown in the vicinity, including tomatoes and grapes by Mr. J. C. Symons; grapes, apples, peaches, oranges, melons, pumpkins, seven varieties of special wheats in the straw, and a lot of well-grown pot-plants, by Mr. W. Hamlyn; grapes and lucern, by Mr. F. S. Keen; fine grapes and apples, by Mr. G. Dabinett (grown at the railway station); and nine samples of wheat (grain), by Mr. J. Sandow.

Address.

Mr. J. C. SYMONS occupied the chair, and in a few words welcomed the delegates and visitors. He then called upon Mr. C. GOODE, of Gladstone Branch, who read a paper to the following effect, entitled—

"GRIEVANCES BETWEEN FARMERS AND WHEAT MERCHANTS."

In starting the farmers' side of the question it was admitted that the wheatbuyers might look at it from another aspect. Trade or exchange that is conducted on fair lines should be satisfactory to both seller and buyer if there is perfect freedom on both sides. Unfortunately, the majority of farmers are not at liberty to buy and sell when and where they like, and many of them have an impression that the merchants, as a rule, get the best of the deal. In seeking relief from this state of things the farmers should be prepared to fight for their rights, and not to accept them as a concession or a charity. Farmers want, like others, to buy in the cheapest and sell in the dearest market, and if the merchants form a ring and endeavor to keep down prices, or when they give but 4d. per pound for the best quality of wheat, and dock 1d. per bushel for every pound that other samples may weigh below the standard of average quality, the farmers should not blame the buyers—for they would do the same thing were their relative positions changed—but blame the sellers for submitting to the exaction. He thought the system of "docking" this season was unfair; it was exceedingly heavy, and one-sided. If wheat weighing 11b. per bushel under the standard is docked 1d. per bushel, why should not wheat weighing 11b. over that standard bring 1d. over market price? Another grievance was the fixing of the standard so late in the season. All wheat sold prior to that fixture, and on the basis of last season's standard, represented a loss to the farmer. Then the farmers, especially those who make a first-class sample, should have something to say in the fixing of the standard of fair average quality. He thought Professor Lowrie's idea of a permanent standard with two grades could be adopted. Seasons such as the present might affect the quality of the wheat, but in ordinary years, within the area intended by nature for wheat-growing, there would be little difficulty in getting a 64lb. or 65lb. standard. A high standard

would give South Australian wheat a good name, and benefit both merchants and farmers. The merchants have opposed the permanent standard, but the farmers should unite and insist upon their rights. The question of bags in is one upon which no unanimity prevails, and it is pretty certain that it adjusts itself in the prices paid for the grain. The reason why farmers have to submit to "ring" prices and severe docking, with little compensation for first-class samples, is found in the fact that too many of them are compelled to part with their wheat as soon as it is harvested, and they are forced to accept prices which they would refuse were they free men. The unfairness of the docking system should be forced upon the attention of the merchants, and if no redress results, the farmers should unite and ship their own wheat through the agency of the banks.

An active discussion ensued, in which it was stated that in the earliest districts a deal of the wheat was marketed before the f.a.q. standard for 1901-2 was fixed by the corn trade section of the Chamber of Commerce. Any grain that fell below the f.a.q. standard of last season, viz., 63lbs., was docked 1d. per bushel for every pound under 63lbs. The standard for this season, which was fixed later on, is 62lbs., so that those who had grain weighing, say, 62lbs. were docked 1d. per bushel, although it was really up to the f.a.q. standard. One member stated that his Ward's Prolific wheat was docked 3d. per bushel. Many of the agents appeared to be too much tied down. A competent buyer should be empowered to give a higher price for an extra good sample. A grower of the red wheats might have a very dirty sample, but it might reach the standard in weight, whilst another grower might bring in an exceedingly clean sample of white wheat and be docked because it weighed slightly less than the f.a.q. standard. It was shown that farmers have combined to ship their own grain, but the experiment was not satisfactory. Every farmer, too, should own a weighing machine, and mark weight on each bag, because discrepancies have often occurred between the weighings on some farms and the weighings at some of the buyers' offices. One speaker said any farmer having, say, a 66lbs. sample, and another of 61lbs., should mix the two, and thus make an average fair sample; but most speakers said the labor involved in this would involve a loss on the transaction. One member said some people have scarcely any conscience, and put any rubbish into the bags, whilst others clean to a high standard. Another speaker remarked that the docked wheat was put into the stack with that which was not docked, and, of course, was sold by the merchant as being of fair average quality, its value being increased by the presence of a quantity of wheat of much greater weight purchased at f.a.q. prices. Thus the merchant pocketed the whole amount of the "docked" farmers' produce, and offered no share to the farmers whose extra good quality wheat enabled him to bring the docked samples up to the f.a.q. standard. Most speakers were agreed that it is desirable to maintain a high standard quality of wheat. It was remarked that the light grain, &c., winnowed out to make a good sample of the rest is not altogether waste, and it is necessary to retain some grain for feeding purposes. One speaker suggested that the Government ought to accept rents, &c., in the form of wheat at, say, 4s. per bushel; and another thought the State should take up the agency for export of wheat as well as of other produce. Ultimately it was decided unanimously, "That it is desirable that there should be a permanent standard fixed for South Australian wheat, with two grades, one of 63lbs. and another of 62lbs."

Wet and Dry Cycles.

Mr. E. J. HECTOR, Port Pirie Branch, read a paper upon this subject. He had until recently entertained the opinion that the rainy seasons and dry periods occurred in cycles, or at regular periods, but was sorry to say that a long series of personal observations, aided by constant records of the rainfall, had failed to establish his theories. He then read the following paper:—

Practically all the precipitation, whether in the form of rain, hail, snow, or dew, which occurs on the earth is derived from evaporation of the ocean. And most of the aqueous vapor that afterwards forms clouds is sucked up from the sea by the burning sun of the tropics,

aided by the never-ceasing warm trade winds which blew over a belt of ocean 3,000 miles wide, which encircles the earth. It had been calculated that the average rainfall all over the earth is 5ft., or 60in. per annum, and, as the most of this must have been evaporated in the tropics, 15ft. to 16ft. of water must have been lifted by the atmosphere every year. Observations made in the Bay of Bengal between 10° and 20° lat. have recorded lin. per day, and other observations made between Calcutta and the Cape of Good Hope registered three-quarters of an inch daily; and all this aqueous vapor is conveyed by the winds in their circuit round the earth, precipitated in the form of rain, hail, or snow as soon as it reaches the climate favorable for its condensation. The south-east trade winds, blowing over about 2,000 miles, reach the belt of calms at near the equator, where they are encountered by the north-east trade winds, causing a heaping-up of the atmosphere, which flows upward and continues its northern course as an upper current until arrested by the north polar current at the Cancer belt of calms, when it descends and continues its course as a warm wind saturated with aqueous vapor, and causes the rains of the temperate zone in the northern hemisphere. In a reverse manner the north-east trade winds, loaded with moisture after reaching the equatorial belt of calms, where they encounter the south-east trades and have to ascend and continue their course as an upper current of air towards the south, until at the belt of calms at Capricorn they encounter the current of air from the south pole, when they descend and continue south as a surface wind, and supply the southern temperate zone with its rainfall. In confirmation of this theory the rain gauge shows an average fall in the temperate zone of the northern hemisphere of 37in., and of only 26in. in the temperate zone of the southern hemisphere. Microscopic organisms, infusoria, and dust peculiar to the Upper Orinoco, and not known in Africa or Asia, have been found in Italy and on the shores of the Mediterranean, east there by the upper currents of air. The northern hemisphere being composed largely of land in the continents of Asia, Europe, and large parts of Africa and America, its sea surface in the tropics is much smaller than that of the southern hemisphere, and if the theory that all the aqueous vapor lifted at the equator continued its course in the upper regions of the atmosphere be correct, then it is obvious the southern hemisphere, with Australia, must have a smaller rainfall than the northern hemisphere, because the tropical sea area in the latter hemisphere supplying its rainfall is very considerably less. Australia, with its large compact area—2,690,000 square miles—about one-half of which is in the tropical zone, lying on the lee side of Asia and the Malayan Archipelago of islands, is not favorably situated for a good rainfall. Its coastal districts are fairly well supplied with a sufficient rainfall of 25in. to 40in. on the mountain ranges which encircle its continent, but these very mountains act as a sponge, and extract all the rain from the clouds, and they float away empty into the interior. No regular rainfall takes place to supply the central pastoral districts, and when it rains it is owing to some monsoonal disturbance. It has been suggested that droughts and rainy seasons come and go in cycles—seven years, eleven years, nineteen years (the lunar cycle), and twenty-eight years (the solar cycle). I have studied my rainfall returns for forty-five years to see if any of these or any other figures would fit for a cycle, and failed to find any. I append a statement of the rainfall at Montura, ten miles east of Strathalbyn, kept by me for twenty-one years; by Mr. Rankine, at Angas Plains, three miles west of Montura, during my absence in Europe; and by Mr. T. Adamson, three miles south of Montura, during my absence in America; and of the rainfall at Valencia, ten miles south of Pirie, kept by myself for twenty-four years. Anyone sweet on the cycle idea can study them or the Adelaide tables. Mr. H. C. Russell, of the Sydney Observatory, now thinks he has discovered the Australian weather cycle to be thirty-five years, which makes our present drought correspond with that of 1864 to 1866, and if so it should break up this year to correspond with the copious rains of 1867. The average rainfall at Montura was 13·7in.—One year above average, followed by three years below, then two years above; next two years below, and three years above again; one year below, then two years above; one year below, with three years above; followed by one year below and one year above. At Valencia, 14·8in.:—Five years below average, two years above, then two years below; next one year above, then one year below and two years above, followed by one year below, three years above; next five years below, next one year medium, and one year below. There is not much regularity in these figures, or chance of getting a cycle of seasons out of them; nor is there in the rainfall returns for Adelaide, extending back sixteen or eighteen more years. The theory that sun spots cause our wet seasons has been revived by our astronomers, and if it is true that when there are large spots upon the sun its heat is intensified, causing greater evaporation and precipitation of rain, therefore increased rainfall in all parts of the earth. Terrestrial magnetism has been supposed to influence the rainfall. It is conjectured that there must be a meteorological pole or pole of winds near latitude 84° N. and longitude 105° W., and that the poles of maximum cold and the magnetic pole are grouped near to it. It is to be hoped that the Antarctic exploration expeditions now in our polar regions will be able to throw some light on the influences at work there which affect our climate and perhaps our rainfall.

Twenty-one years' observations at Montura, Langhorne's Creek, showed that the average annual rainfall was 13·7in. Six years fell below the average, viz.,

1859, 1860, 1864, 1865, 1869, and 1876. The years 1861 and 1872 had an average rainfall, and the wet years totalled thirteen, viz., 1856, 1857, 1862, 1863, 1866, 1867, 1868, 1870, 1871, 1873, 1874, 1875, and 1877.

Twenty-four years' record at Valencia, near Port Pirie, where the average annual rainfall was 14·8 in., showed thirteen dry seasons, viz., 1878, 1879, 1880, 1881, 1882, 1885, 1886, 1888, 1891, 1895, 1897, 1898, 1899. Three seasons had a medium rainfall, viz., 1896, 1900, and 1901. The eight wet years were 1883, 1884, 1887, 1889, 1890, 1892, 1893, and 1894.

There was not much discussion, but it was suggested that there might be something in the fact that both sets of observations were taken rather too near to the sea coast. It was also remarked that whilst some of the seasons were rainy in the southern parts there were dry years in the north, and rainy years in the north were balanced by dry periods in the south.

AFTERNOON SESSION.

Business was resumed at shortly after 2·30 p.m., and the Chairman called upon Mr. HENRY KELLY, who read a paper to the following effect upon

WHEAT PICKLING.

A farmer could not expect his crop to be free from bunt if he pickled his wheat with cheap or inferior bluestone. He had been told by a dealer that there was plenty of such. Pickling with bluestone is an old practice with most farmers, and he who does not pickle his seed runs a great risk. In early days, when pickling was not so prevalent, it was not uncommon that a farmer had to wash his wheat—perhaps twenty to 100 bags—before the miller would buy it. He had helped to wash wheat in tubs, &c., beside a running stream, and taken advantage of a hot day, when the washed grain was dried on tarpaulins or winnowing sheets. Many pickling substances were used in those days, but Dollman's "Farmer's Friend" and other chemical compounds led on to the use of pure bluestone solution as the almost universal panacea for suppression of bunt in wheat. The first imports of bluestone for this purpose were made by Mr. W. Paxton, a chemist, and Messrs. Blyth Brothers, about 1846. During his forty years' experience as a farmer he (Mr. Kelly) had not seen any adulterated bluestone. He used 1 lb of it to 4 bush. of wheat. Dissolved in a bucket of water, sprinkled it on the grain, turned it over three times. Used to pickle six to ten bags at once, with two men to shovel it over, and one to sweep the grain inwards. The bags were always pickled previously to filling with the pickled seed, and the seed, when dry, would keep for several weeks if necessary. Mr. Kelly then gave particulars as to how sulphate of copper may be adulterated with sulphate of iron, bluestone being worth £28 per ton and sulphate of iron worth about 50s. per ton. Quoting Dr. N. A. Cobb, Vegetable Pathologist, Department of Agriculture, New South Wales, he mentioned that bunt is the form which produces small grains in the wheat ears, and has a stinking odor; smut, or loose smut, is that from which mostly blows away, and often attacks oats and barley, as well as wheat. [Mr. Kelly's paper was voluminous, and interesting from an historical point of view. In the *Journal of Agriculture* for this present month, however, will be found a reprint of an article on "Pickling Wheat," by Professor W. Lowrie, B.A.Sc., which gives practically all that can usefully be said upon the subject.—Ed.]

In discussion it was elicited that bluestone will dissolve more quickly in hot water than in cold, and if hung in a bag just beneath the surface of water in a tub will dissolve more quickly than if put at the bottom. It is desirable to pickle wheat at least forty-eight hours before sowing it, and 8 ozs. of bluestone are quite sufficient to pickle a bag of seed (4 bush.), unless there is much bunt or smut visible. One member said he tried some experiments. He pickled some badly-bunted seed in bluestone solution, and the crop turned out perfectly clean. He also sowed some clean seed without pickling, and got a clean crop. Then he dipped some clean wheat into the bunt-blackened solution of bluestone, which had stood for some days, and that portion of his crop was very badly affected by bunt. Another member rubbed bunt up with good clean seed, pickled one-half with bluestone solution, and sowed the other half without any pickling alongside the pickled seed. The lot that was not pickled was all bunted, whilst the other lot was quite clean. He does not use more than 4 ozs. bluestone to pickle 4 bush. of seed.

The Chairman next called upon Mr. T. DUNSFORD, Narridy Branch, who read a paper to the following effect :—

MY EXPERIENCES WITH SHEEP ON THE FARM.

His first acquaintance with sheep occurred on his father's farm in the west of England, where they were relied upon as a source of rent-making, and as renovators of the fertility of the soil. Under intense cultivation, with irrigation, luxuriant feed was produced, on which lambs were turned, which in two months were worth 30s. Lincolns and South Downs were chiefly bred there. He described the method of hurdling on the crops of turnips, &c. Such a system could not be followed in this hot dry climate. When he took up a farm in this State he had to learn to adapt his practice to the climatic and soil conditions. He acquired a farm of 500 acres that had been continuously cropped until worn out, and concluded to try and renovate it with the aid of sheep, of which he procured 150; divided his farm into three parts, kept the sheep continually on the fallowed paddock until all the weeds were destroyed. By this means, and cropping either paddock only once in three years, the growth is luxuriant and of a vivid green. Nearly every farm has patches of light loamy soil upon which nothing grows in summer; but sheep will always select such spots for camping upon, and in time will convert the land into fertility, making the whole holding of one even texture or quality. It does not pay to allow the land to be too much enriched with nitrogenous matter in this climate. As to profit, he has now about 1,000 acres, and keeps 400 sheep alternately depasturing. They average 7lbs of wool, which, at 6d. per pound, gives £70; 100 fat wethers, at 10s., gives £50. Lambs are reared to replace the wethers, and the old ewes are also sold, so, with meat for home use, say twenty-six sheep for the year, and keeping up a fixed stock, the flock net £146 a year.

In regard to fertilising the land, nearly every speaker admitted that nitrogenous manures are very liable to cause too rank a growth in cereal crops if liberally supplied; but in regard to phosphatic fertilisers, several stated that they had found that it pays well to apply a good deal more than has usually been given. One member said he had been cultivating 500 acres annually with wheat, but latterly had given up 300 acres of this to sheep, and with profitable results. He divided his farm into three paddocks, and was very careful not to overstock.

Wool and Wool-classing.

The next to address the Conference was Mr. GEO. JEFFERY, who spoke about "Wool and Wool-classing." His advice was very similar to that given at Quorn last year, and at various other meetings. Use strong-framed Merino ewes, and have only a first cross with a Shropshire or other good ram. Do not be too particular in close skirting, and do not be anxious to make several classes. Do not tie the fleeces, but fold them neatly, so as to show the best wool; the buyers will look carefully for the inferior parts of the fleece. Avoid the presence of straw, chips, and everything of a vegetable origin in the fleece. Take care of all skins; skin directly the animal is killed, else the skin will be blood-stained. Apply anti-weevil compound, else the value of the skin will be depreciated. Every farmer should keep some sheep, but must be careful not to overstock, else the clip will be less in bulk and of less value. The average weight of ewes' wool at the Agricultural College was 11lbs., which at only 4d. per pound was profitable, even not taking the lambs into account. Mr. Jeffrey afterwards answered a few questions.

Adjourned for tea.

EVENING SESSION.

At 7.40 the Conference re-assembled, and the Chairman called upon the GENERAL SECRETARY to read a very voluminous paper by Mr. R. Marshall, of Central Bureau, to the following purport :—

MAKING, SELECTING, AND TESTING OF WHEATS SUITABLE TO SOUTH AUSTRALIAN CONDITIONS:
IS IT THE DUTY OF THE GOVERNMENT TO DO THE WORK?

The gist of Mr. Marshall's argument was that it is possible to greatly increase the yield of wheat upon a given area by improving the varieties. This can be brought about by careful selection of what may be termed "stud" plants, possessed of the highest desirable qualities,

such as prolific yield, disease-resisting constitution, early maturing, hardy, suitable to the soil and climatic conditions of the locality where they are to be grown, not liable to become laid or knocked down by wind, easy to thrash without liability to shatter out the seed when ripe, strong in gluten of first quality, and of best milling character. Such characteristics can be developed by cross-breeding and careful selection and treatment by men who thoroughly understand what they are aiming to secure. This fact has already been proved by several scientific experimentalists in regard to the cereals [and by very many others in regard to fruits, vegetables, flowers, as well as in regard to all kinds of domesticated animals.—GEN. SEC.] Mr. Marshall quoted the opinions and experiences of a host of witnesses in support of his contention, including Robert H. Dunham, the Hon. J. A. Isaacs, Girtton Brothers (who have done wonders in this direction), Dr. Cobb, W. Farrar, and very many others, not forgetting the experiences at the numerous agronomical stations, universities, &c., of the United States of America. They were all agreed as to the enormous importance of the work undertaken in this direction, testified to the great progress already made, and dilated upon the blessings that would follow upon the full attainment of the objects sought under the operations that are being conducted. Mr. Marshall argued—and in this he is supported by all the authorities quoted—that the work is of a national importance, but too great and too onerous for any private person to undertake. It requires the undivided attention throughout the whole year of a scientific and skilful manipulator, one accustomed to such work, able to analyse, test, select, and to perform the thousand and one necessary operations to arrive at the desired end. It was truly a most important national work, and one that, in his opinion, could only be properly and efficiently taken in hand by the State. Varieties of grain possessing all the desirable qualities could be developed at the experimental station or stations selected, and, after being fully tested and approved, could then be distributed to the various districts, where their suitability to the climatic and other conditions of each locality could be proved or disproved.

Mr. Marshall's paper was greatly approved on all hands; and, after many complimentary remarks, the following resolution was unanimously adopted:—

That this Conference is desirous that the Department of Agriculture should undertake the work of developing and testing such varieties of wheat that may be most prolific, rust-resisting, of best milling quality, nourishing, and suitable to the varying conditions of climate in this State.

A discussion then arose as to whether a recommendation should be made as to where the work should be conducted. Some thought the Agricultural College would be the best spot and the director would be the best man; but others argued that, as the work required the continuous undivided attention of the experimentalist, there would be no hope that the director could find time to attend to the work, and the subject was dropped.

Thanks and Social.

After a few remarks by the General Secretary upon "Effect of Large Forests upon Climatic Conditions," a comprehensive vote of thanks to all concerned was adopted, and a social finished the proceedings.

CENTRAL AGRICULTURAL BUREAU.

MONDAY, FEBRUARY 17, 1902.

Present—Mr. F. E. H. W. Krichauff (Chairman), Hon. A. W. Sandford. M.L.C., Messrs. W. C. Grasby, R. Marshall, M. Holtze, J. Miller, M.P., T. B. Robson, G. Quinn, C. J. Valentine, and Secretary (A. Molineux).

New Members.

The Hon. MINISTER OF AGRICULTURE intimated that Mr. George Quinn had been appointed as a member of the Central Bureau. The Chairman welcomed Mr. Quinn on behalf of the members.

Improvement of Wheats.

Mr. MARSHALL tabled a paper on this subject; also reports from Victoria and Queensland on the same subject. It was decided to discuss the matter at the March meeting.

The CHAIRMAN read report received from Holder Branch on Theiss wheat. This variety proved the hardiest of those tried by the Hon. Secretary. With a rainfall of only 5in. during the growing period, the return was at the rate of 2bush. per acre.

Inspection of Fertilisers.

Mr. MILLER inquired as to what was being done to test the fertilisers imported into South Australia; large quantities were being imported through Port Pirie and Wallaroo, besides the locally manufactured article was being sold largely, but as far as he knew there was no check on the vendors.

Mr. SANDFORD said he found the Inspector of Fertilisers (Mr. W. L. Summers) particularly vigilant in his duties; from personal experience of the manner in which the inspection was carried out he was sure it was effective.

Mr. SUMMERS, who was present, thought he would be able to satisfy members that there had been a proper inspection. He had paid visits to Port Adelaide and Wallaroo, and had inspected all shipments except one, a small consignment, a portion of which would be sampled on the following day. As regarded the strength of the fertilisers, the analysis showed that they were well up to the stated strength, and he knew that on the average farmers were getting an article of higher quality than was actually guaranteed. He did not know if farmers neglected to obtain invoices with the consignments of manures forwarded to them, as stated by Mr. Miller, but if they failed to do so and were deceived they had no one to blame but themselves. He had not been to Port Pirie, but the Sub-Collector of Customs had boarded the only manure ship there, and obtained a sample, which had been sent to him for analysis. A large number of samples were also obtained from the manufactories round Adelaide for analysis.

Phylloxera in Victoria.

Mr. J. MILLER called attention to a report that phylloxera was spreading at an alarming rate in the vineyards in the Epsom and Huntley districts of Victoria, and the Government of the sister State were taking no special precautions for checking the pest.

Mr. G. QUINN said it appeared that the Victorian Government were not taking any action for the suppression of phylloxera, but, on the contrary, were allowing the planting of American stocks. Every effort was being made by a close inspection of all plants coming from Victoria to prevent the introduction of the pest into South Australia. The action of the Victorian Government in the matter would result in phylloxera being brought to this State sooner than otherwise would be the case.

Mr. SANDFORD said the matter was one of exceptional importance to the vinegrowers, and they should be warned of the state of affairs in Victoria.

Mr. HOLTZE declared that considerable care, especially in the inspection of the plants coming from Victoria, would have to be exercised to prevent the admission of the disease. He moved—"That this Bureau views with alarm the spread of phylloxera in a neighboring State, and the reports made that the authorities there have desisted from making strenuous efforts to prevent the spread of this enemy to viticulturists; and requests that the inspectors be specially instructed to take rigorous measures for the prevention of the introduction of this and other diseases by the importation of plants."

Mr. SANDFORD seconded the motion, and it was carried unanimously.

The Codlin Moth.

Mr. HOLTZE asked whether codlin moth infested fruit which had been so treated as to kill the moth might not be allowed to be sold. He believed that if the fruit were placed in a chamber and fumigated with hydrocyanic acid

gas, or some non-poisonous gas, the moth would be killed, while gardeners would be able to get something for their fruit. He had heard that there was a shortage of apples and pears this year.

Mr. G. QUINN said no fumigated apples would be fit for sale unless treated with carbonic acid gas. Growers were given the privilege of selling infested fruit to factories, provided that they soaked it for a stated time and obtained a permit. Although copies of the regulations in which this was set forth had been circulated throughout the hills district, only three applications for permits had been made. During the past fortnight he had taken a trip through the hills and the Angaston districts. The gardens in the hills were in a very neglected state. He spent all one day inspecting orchards in one district and could safely say he did not see £5 worth of apples. A few growers were doing their best, and with considerable success, but very few orchardists were properly trying to keep the pest under control. In one garden he found 128 caterpillars and pupæ, principally the latter, around a single tree. He thought the only thing to do would be to punish all those people who failed to comply with the regulations. Certain gardeners who had fine vegetable crops paid practically all their attention to them, and visited their fruit trees only once or twice a year. They should not be allowed to keep orchards. He was not in sympathy with Mr. Holtze's proposal, as it would relieve the growers of the results of their carelessness. In the Angaston district he spent three days, and with one exception there was no complaint. The gardens were kept clean. Mr. Robin had had the codlin moth in his orchard four seasons, and although he (Mr. Quinn) made a careful search among the trees recently, it was some time before he could find evidence of the presence of the moth. This showed that the careful attention paid to the trees by the owner was having a satisfactory result.

Mr. T. ROBSON considered the inspectors should make more regular visits to the orchards, and the regulations should be more strictly enforced. This he believed would have more effect in checking the spread of the moth than if the inspectors stayed in the markets for the purpose of punishing those found distributing the pest. The best way to get rid of the caterpillars was to allow the sale of the fruit.

Mr. QUINN said it was intended to make the inspection more thorough in the future, and to prosecute those orchardists who persistently neglected to take reasonable precautions against the spread of the insect, but to allow the sale of infected fruit was putting a premium on carelessness.

Bureau Conferences.

The SECRETARY reported that the Millicent Conference was to be held on March 19, and Strathalbyn on April 10, and members of Central Bureau were invited to attend each gathering.

"Journal of Agriculture."

In reply to question, the SECRETARY said that with the funds provided for printing it was impossible to publish all the information and reports which were furnished to the Bureau. With the limited funds available he was bound to select only the most practical matter submitted, and to condense this as much as possible.

New Members.

The following gentlemen were approved as members of the undermentioned Branches:—Port Pirie, Mr. H. Williams; Booleroo Centre, Mr. J. Murdoch; Inkerman, Mr. R. Kennedy; Wilmington, Messrs. M. Bischoff and P. L. Sullivan; Renmark, Mr. R. Nuttall; Elbow Hill, Mr. W. Robertson; Kapunda,

Messrs. J. Correll and H. A. Holthouse; Bowhill, Mr. S. Johnson; Stockport, Messrs. C. Harlnett and A. Callier; Naracoorte, Messrs. W. McKay, J. B. Burnett, W. A. Terry; Yorketown, Mr. R. Newbold; Narridy, Mr. H. B. Turner; Strathalbyn, Mr. J. H. Mules; Meningie, Mr. Fred Ayres; and Caltowie, Mr. J. McCallum.

Reports by Branches.

The SECRETARY reported receipt, since previous meeting, of sixty-four reports of Branch meetings.

REPORTS BY BRANCHES.

Tatiara, January 25.

Present—Messrs. E. Prescott (chair), R. Penny, T. Hall, F. Smith, H. Killmier, W. H. Killmier, C. H. Wiese, and T. Stanton (Hon. Sec.).

CEREAL EXPERIMENTS.—Mr. Penny tabled samples of Beardless barley and Skinless barley. He was well pleased with returns, and intended to sow a larger area next season for feed for pigs. Members considered the sample to be of good quality. Mr. Wiese tabled sample of rust-resisting wheat of good quality.

CODLIN MOTH.—It was decided to ask the Chief Inspector of Stock to take action to prevent the sale of codlin moth infested fruit in this district.

WATTLE-GROWING.—Mr. Hall's paper on this subject was discussed, and it was generally agreed that it would pay to sow wattles on some of the poor sandy lands in this district.

Wilmington, January 20.

Present—Messrs. W. Sice (chair), T. H. Harris, M. Gray, J. W. Schuppan, J. Zimmermann, A. Maslin, J. McLeod, N. Hannigan, R. Cole, F. Bauer, J. Lauterbach, and R. G. S. Payne (Hon. Sec.).

CHAIRMAN.—The Hon. Secretary reported receipt of resignation of Mr. J. Hutchens, who had left the district. On the 8th January members met to say farewell to Mr. Hutchens, and presented him with an address expressing their appreciation of his valuable services, and their regret at his removal from the district.

DAIRYING.—The Hon. Secretary reported favorably upon condition of the shorthorn bull Roan Duke, belonging to the Branch. Arrangements for keep, etc., of the bull during the year were made.

Cradoek, January 25.

Present—Messrs. R. Ruddock (chair), T. Marsh, J. Turner, P. Gillick, A. N. Graham, J. H. Lindo (Hon. Sec.), and two visitors.

STANDARD SAMPLE OF WHEAT.—Members considered present method of fixing the standard very unsatisfactory. It should be fixed earlier in the season, and according to the average of samples offered for sale, and not upon the average of wheat sold at previous season's standard, without deduction.

FARMING IN DRY DISTRICTS.—The Secretary directed attention to a paragraph in "Notes and Comments" in December issue of *Journal of Agriculture* concerning the farmers in dry districts. Members were surprised that the General Secretary saw fit to compliment the Commissioner of Insolvency, who had gone out of his way to reflect on an unfortunate farmer who had failed in his occupation through no fault of his own. They also protest against the

General Secretary's sarcastic reflections upon the intelligence of the Northern farmers, as they consider they are unwarranted and uncalled for. The members consider them illogical, also, as the General Secretary should know that after almost total failure of crops for six years the Northern farmers have not the means of taking up land within the limits of a decent rainfall; in addition, members would like to know where there is sufficient land within such districts that can be obtained for all the farmers now settled upon country with an annual rainfall of 8 in. or less.

Watervale, January 20.

Present—Messrs. J. Thomas (chair), B. Perrin, G. Holder, H. Scovell, H. A. Ashton, and E. Treloar (Hon. Sec.).

EXPERIMENTS WITH WHEATS.—Mr. H. A. Ashton tabled sample of Gamma wheat grown from 80zs. seed received from Central Bureau, sown June 17th, 1901, which yielded 22lbs. Mr. J. Thomas tabled sample of Marshall's No. 3 wheat, a splendid sample from a crop of ninety acres, which produced 560 bags.

Holder, January 25.

Present—Messrs. J. Rossiter (chair), W. Wood, J. Green, F. Crocker, F. G. Rogers, S. Pickering, J. J. Odgers (Hon. Sec.), and one visitor.

EXPERIMENTS WITH WHEATS.—Mr. Green said World's Champion wheat had produced some fine heads. Mr. Odgers said the best wheat he had grown was Theiss, sent to him by Mr. Krichauff. Members were agreed that plump and well-matured seeds are best for sowing, as they give healthy, vigorous plants. Seeds that were ploughed in thin last season gave a poorer return than where harrowed in. This was probably due to the scanty rainfall.

Renmark, January 23.

Present—Messrs. C. R. Rose (chair), C. Millar, R. Kelly, W. J. Moffatt, F. S. Wyllie, M. Chapman, F. Turner, F. Cole (Hon. Sec.), and two visitors.

THE ORANGE.—Mr. C. R. Rose read a paper to the following effect:—

The orange is of comparatively modern introduction in horticulture. It is not mentioned in the scriptures, nor by Herodotus, who lived five centuries before Christ, and who wrote a list of fruits then known, nor by Virgil, who wrote much about such matters 100 years before the Christian era. The orange came originally from the south of China, Burmah, and India. It is found growing wild in the jungles in various parts of India. The Arabs introduced the orange to their country, and thence it got to Syria and Southern Europe. This was probably the bitter orange. The sweet variety was brought to Europe about the fourteenth century by merchants of Genoa or Portugal. Thence the tree was passed by the Spaniards and Portuguese to the Azores and other parts of the "New World," and found congenial conditions. Mexico, Florida, California, proved to be highly suitable. The St. Michael orange originated in the Azores; the Pernambuco and Bahia (or Navel) were both named after provinces in Brazil. The orange is now found growing in nearly every country where there is enough sunlight and absence of severe frosts. [Here occurs a lengthy digression re growing orange trees in tubs in hothouses in Scotland, travel by bullock-cart in India, paddy fields, natural irrigation, neglected orange trees, small yields of fruit, yet very sweet, coarse in grain, thick-skinned, etc.—GEN. SEC.]

The orange tree seems to thrive in many different kinds of soil. In the Azores the soil is intensely volcanic, which is highly suitable, but in Renmark the tree grows on sand and on stiff clay with equally good results, but the growth is more rampant on the sand, so that it may be fairly concluded that as long as there is sufficient nourishment and moisture in the soil, combined with proper drainage, the orange will do well. The essentials in nourishment are chiefly potash, nitrogen, lime, and phosphoric acid, together with several

other substances in small quantities, which are almost universally distributed in all soils. Even when all the necessary constituents of plant food are originally present in the soil some or all of them will in time become more or less deficient when crops of any kind are grown without restoration by means of fertilisers. The farmer's land is not racked by crops all the year through, but the orangery is making calls on the soil during the whole time. It is a mistake to starve fruit trees, but the application of manures on too liberal a scale will produce a rank growth of wood with little or no fruit, or there may be an excessive crop of undersized oranges. The first defect is due to too much nitrogen, the other to an excess of phosphoric acid and lime. A moderate dressing with fertilisers each year is better than one heavy application every three years. If a tree has sparse and few leaves, and there is no lack of moisture, we may reasonably conclude that nitrogen is lacking in the soil, but if there is vigorous growth and little fruit it is probable that lime and phosphoric acid are needed. Drainage is necessary where there is an excess of water, but with the scanty rainfall and regular irrigation at Renmark the danger is reduced to a minimum. The ground should be kept damp, but never swampy. In winter the soil must be kept moist, as at that time the trees are maturing a crop and forming buds which are to supply the crop of the succeeding year. Moisture in winter prevents the tree suffering from the effects of frost. [Here followed several instances where orange groves had suffered severely from frost in former years in France and Florida, where great expense is incurred in providing protection against extreme cold.—GEN. SEC.]

Renmark settlers cannot wait long enough to propagate trees, so they must procure them ready for planting out from nurseries, and they must carefully guard against the introduction of *Leerya purchasii*, and other insect pests as well as fungus diseases. There should be a law against the introduction of diseased trees as well as against diseased fruit. There are about twenty-five species of fungus diseases, and very many kinds of borers, scales, beetles, caterpillars, and other insect pests affecting fruit trees and vines in Australasia, but very few or none of them at present are found at Renmark. We owe it as a duty to ourselves and our neighbors to maintain a vigilant lookout for the first appearance of any pest or disease, and should such appear to use the most vigorous and effective means to at once suppress it. [The essayist here drew attention to a pamphlet issued by the Agricultural Department of New South Wales dealing with such pests and diseases and the remedies to be adopted. He might also have quoted a similar pamphlet issued by the Central Agricultural Bureau of South Australia some time ago. He objected to the cyanide of potassium treatment for insect pests because the cyanide gas is very poisonous to human beings, and because the application must not be made when the sunlight is strong, but both objections are untenable in the face of the great efficacy of the treatment, and the fact that arsenates are constantly used with safety although very poisonous.—GEN. SEC.] Newly-planted orange trees must be sheltered, the soil must be constantly maintained in a free and open condition by the use of the hoe, especially beneath the branches of the trees, where there is a favorite breeding harbor for grubs and all sorts of insect pests. In regard to pruning the orange tree should be in a solid compact mass, like a well-built haystack. To attain this allow the tree to grow in the centre and at the same time shorten the lateral branches. The fruit should be gathered with great care to avoid bruising. In August, 1895, the writer planted 600 orange trees, and now the average height is 10ft., girth round the branches 30ft., the butts at 1ft. from ground average 15in. These are Washington Navel, a Siletta tree, six years old, produced 500 oranges. The fruit from this orangery has taken eight first prizes at shows in Adelaide, Mildura, and Renmark. Much damage is done to Renmark fruit by exposing the cases on open trucks, covered with a tarpaulin, between Morgan and Adelaide, when the shade temperature reaches 100° or more. Some effort should be made to secure an alteration in this respect.

Discussion took place upon the best kind of stock to bud or graft the orange upon, but no conclusion arrived at. *Re* fumigation Mr. Rose said the cost of fumigation with hydrocyanic acid gas is very small after the first cost of tents, and that fumigation kills every insect on the tree, whilst spraying always misses a number of them.

Hartley, January 29.

Present—Messrs. J. Stanton (chair), W. Klenke, W. Kutzer, W. Cross, H. Reimers, A. Jaensch, T. Jaensch, J. Jaensch, B. Wundersitz (Hon. Sec.), and one visitor.

CO-OPERATION.—Mr. Mitchell, director of the S.A. Farmers' Co-operative Union, gave an interesting account of the aims and work of the union. Various matters connected with the working of the union were explained. Members were of opinion that the union deserved to be better supported by the farmers.

Appila-Yarrowie, January 24.

Present—Messrs. P. Lawson (chair), J. C. W. Keller, C. W. H. Hirsch, A. Fox, N. Hannagan, J. Daly, J. H. Klemm, W. C. Francis, and C. G. F. Bauer (Hon. Sec.).

TAKEALL.—Members are of the opinion that this disease is worst in wet seasons; a good rain in spring checks it; it is most prevalent on dark, loose soils, and on late fallowed land; all varieties of wheat are subject to the trouble; the top ridges of crab-hole country suffer most.

CONSTITUTION OF BUREAU.—Members do not favor any alteration in respect to Central Bureau, but think Branches should consist of twenty members.

Port Germein, January 18.

Present—Messrs. G. Stone (chair), E. G. Bleising, H. Kingcome, Thos. Smith, J. K. Deer, W. Holman, J. R. Gluyas, P. Hillam, and A. H. Thomas (Hon. Sec.).

REPORTS ON EXPERIMENTS.—Mr. Holman stated that he had raised some plants of Algaroba bean, but they were not thriving. Other members reported failure with the seeds. [Unless the seeds are scalded, the same as is usual with wattle seeds, it is probable they will remain in the soil for a long time before germinating.—GEN. SEC.] Mr. Crittenden reported that he had reaped 20lbs. Club Head wheat, the produce of the small quantity of seed sent out by the Central Bureau; it yielded fairly well, but was not early enough for this district. The Chairman tabled barley grown by himself; it was not a success, the season being too dry, but he would try it again.

TAKEALL.—This is practically unknown in this locality, but those members who had had experience of it in the southern districts found it was worse in wet seasons and on Bay of Biscay ground.

Kapunda, February 1.

Present—Messrs. W. M. Shannon (chair), G. Teagle, W. Flavel, C. E. Weckert, J. J. O'Sullivan, J. H. Pascoe, Peter Kerin, Pat. Kerin, B. R. Banyer, and G. Harris (Hon. Sec.).

THE AVERAGE HARVEST.—Some members believe that the average of the district will not meet expectations by one-third. The hot winds had checked development in some cases, and red rust had reduced yields seriously in many places. Mr. Teagle had reaped seventy-five bags of King's Solid Straw, not one of which weighed less than 4½bush., described by some of the buyers as a record sample. Mr. O'Sullivan had 20bush. of King's Solid Straw, which had been far too advanced for the rust to injure it. The later the crop the worse it turned out. Mr. Weckert had a crop of early-sown wheat that averaged 20bush. per acre; it was almost ripe before the hot day that did so much damage to later crops. The rain had done a lot of injury; but Mr. Flavel said rain caused the wheat to take longer to grow and the heads filled better. The Chairman found that cultivation had much to do with the character of the crop. On fallowed land he got 23bush. per acre from Purple Straw, whilst on unfallowed soil he got 12bush. Did not think that rust caused much deficiency—it was more due to hot weather. Gluyas, which is resistant, sown last week in June, alongside Purple Straw, gave 13bush. per acre. He had tried two kinds of new wheat—one from New South Wales, named Sullivan's Early Prolific. It cost 14s. per bush., and was stated to have yielded 53bush. per

acre. It appeared to be an improved Steinwedel, with larger heads, and would probably be heard of further on. They would have to practice more of fallowing, and land should only be cropped once in three years. It would pay to use 1cwt. super. per acre. He then read a paragraph from January number of this *Journal*, referring to the hard wheats of Kansas.

Golden Grove, January 23.

Present—Messrs. R. Smith (chair), J. McKwen, J. R. Smart, J. Woodhead, R. Mountstephen, J. Rawlins, T. G. McPharlin, F. Buder, J. R. Coles (Hon. Sec.), and one visitor.

CODLIN MOTH.—Mr. Buder said he kept his orchard fairly clean by bandaging his trees and collecting and treating all fallen and affected fruit. Mr. Mountstephen destroyed all young fruit on apple, pear, and quince trees last year, and found very few codlin caterpillars this year. Mr. Smith was of the opinion that if all pip fruit were destroyed directly it has set in one year there would be no codlin moth left.

WORK OF BUREAU.—Mr. Coles expressed the opinion that each Branch should deal with each separate branch of agronomy at every meeting. This would make the Agricultural Bureau a most valuable educational institution. He had recently visited Messrs. Bowmans' farm. They are members of Onctree Hill Branch. Their system of dairying is the most simple that he has experienced. They grow lucern in valleys that are suitable, and the cows are turned in daily for a short time, and thus are supplied with green feed all the year round. The lucern has been manured with 5cwts. bonedust per acre.

Willunga, February 1.

Present—Messrs. T. Pengilly (chair), John Binney, A. Slade, J. Valentine, W. J. Blacker, and C. Bray (Hon. Sec.).

RUST-RESISTING WHEATS.—Mr. T. Pengilly undertook to conduct experiments with rust-resisting wheats. Mr. Blacker, M.P., suggested that the Branch should recommend farmers to grow more grain and cut less for hay. To be considered at next meeting.

EXHIBIT.—Mr. Pengilly tabled some excellent Beauty of Hebron potatoes, grown on reclaimed swamp, which a short time back was considered to be worthless.

Pyap, January 15.

Present—Messrs. J. F. Bankhead (chair), W. Axon, G. H. Mills, G. T. Napier, F. Theil , A. Westbrook, and B. T. H. Cox (Hon. Sec.).

TAKEALL.—Two members gave opinions that this trouble with wheat is worst during dry seasons; good rains in spring appear to increase its ravages, both on heavy firm land and on loose sandy soil or rubbly loam. Their land had been cropped without fallowing and was in the fourth season of cropping, seed sown broadcast without manure. One considers the trouble is worst on his heavy, firm land, but the other holds that it effects more damage on light, loose soil. The first rolled and the latter did not roll his land. No kind of wheat appears to be immune, so far as their experience goes. Mr. Westbrook said he rolled his crop the third season, when it was about 6in. high, and it showed very little sign of the trouble as compared with previous crops.

RUTHERGLEN FLY.—This bug is very prevalent this season and is doing much damage amongst fruit and vegetables. Apricots especially have been greatly depreciated in value by them. [This insect is indigenous to all Australia, and its vernacular name, "pied fly-bug," given by the late Frazer S. Crawford, is more appropriate than that of "Rutherglen fly." It is not a fly. It was until recently called *Rhyparochromus*, sp., but has lately been identified as related to the American false chinch-bug (*Nysius destructor*), and is named by entomologists *Nysius vinitor*. In Victoria the cultivators use a spray made with benzole soap, which is much cheaper and more easily applied than pure benzole for destroying this pied fly bug.—GEN. SEC.]

Mundoorra, January 27.

Present—Messrs. R. Harris (chair), W. J. Shearer, J. Blake, W. Aitchison, W. D. Tonkin, D. Owens, H. Haimes, J. J. Vanstone, J. Loveridge, D. Smith, and A. E. Gardiner (Hon. Sec.).

WHEAT SAMPLES.—Wheat in this locality fully averages the f.a.q. standard fixed by the Chamber of Commerce. Chairman tabled and distributed samples of Allora Spring wheat, weighing 66lbs. per bushel, grown from a few seeds received a few years ago. He now has several bags of it. Some Purple Straw wheat grown close alongside weighed only 59lbs. per bushel, though both sorts were drilled on the same day under exactly similar conditions, but the Purple Straw was badly affected by red rust. Mr. Aitchison tabled Phillis's Marvel, weighing 66lbs. per bushel. Mr. Shearer brought Gluyas Early, 65½lbs. per bushel, and Pioneer, 67lbs., both grown by Cummins Bros. Mr. Vanstone showed Hawke's Club Head and World's Champion, grown from seed procured by Central Bureau from W. H. Hawke, Tiparra.

RED RUST.—After a long discussion members concluded that most farmers should grow the rust-resistant wheats, and more than one or two varieties, amongst which are Budd's Rust-resisting, Petatz Surprise, Baroota Wonder, and Gluyas's Early. Phillis's Marvel and Marshall's No. 3 escaped rust this season, but are new to the district, and Steinwedel is early and sometimes rust-escaping.

Pine Forest, January 14.

Present—Messrs. J. Phillis (chair), R. W. Bawden, W. H. Jettner, F. Bayne, and R. Barr, jun (Hon. Sec.).

OFFICERS.—Messrs. F. Bayne and R. Barr, jun., were elected Chairman and Hon. Secretary for ensuing year, a vote of thanks being accorded to the officers for their services during past year. It was decided to celebrate the completion of the ten years' existence of the Branch by holding a picnic.

WHEAT YIELD.—Mention was made of the greatly decreased yield of wheat owing to the ravages of red rust, and of the advisableness of cultivating increased areas of rust-resistant wheats, although less prolific than some of the softer varieties.

Koolunga, January 23.

Present—Messrs. T. B. Butcher (chair), J. Button, R. Palmer, J. Sandow, E. J. Shipway, R. Lawry, G. Jose, W. T. Cooper, G. Cooper, J. Butterfield, J. C. Noack (Hon. Sec.), and two visitors.

STANDARD WEIGHT OF WHEAT.—Members consider it desirable that the standard weight should be fixed earlier in the season, some of them having suffered pecuniary loss through the delay in fixing the standard.

EXPERIMENTAL PLOTS.—Messrs. Sandow, Button, and Jose reported on their experimental plots. Samples of different wheats were also shown. Mr. Sandow applied 150lbs. manure and 75lbs. respectively, and got double the quantity of wheat from the plot receiving the heavier dressing. He strongly advised farmers to carry out experimental work for themselves. Members considered Marshall's Hybrid, Gamma, World's Champion, Red Straw, Purple Straw, Majestic, and Jose's Early the most suitable wheats for the district.

Murray Bridge, January 25.

Present—Messrs. R. Edwards (chair), J. Standen, A. Kutzner, J. G. Newman, B. T. E. Jaensch, Heinrich Schubert, Herman Schubert, J. Stacker, W. Wundernitz, W. Schubert, W. Lehmann (Hon. Sec.), and three visitors.

WHEAT EXPERIMENTS.—The Hon. Secretary reported on experiments with different wheats as follows:—

Variety.	Seed Sown.	Yield.	Weight per Bush.
Buck's Early	10½lbs.	266lbs.	63½lbs.
Early Velvet	90lbs.	12 bags	60lbs.
Hawke's Clubhead	90zs.	12lbs.	63lbs.
World's Champion	60zs.	10lbs.	60lbs.
Theiss	40zs.	4lbs.	62½lbs.
Ranjit	30lbs.	9bush.	62½lbs.
Purple Straw	1 bag	12 bags	63½lbs.

Buck's Early was brought from Queensland by Mr. B. T. E. Jaensch, is fairly early, and a promising yielder. Hawke's Clubhead was straight and stiff in straw, with a thick short head and small round grain; it was a fair yielder. World's Champion was a fine looking wheat with large head, but the grain was disappointing. Theiss wheat, obtained by Mr. Krichauff from Germany, is a late creeping variety with short weak straw; it was sown in the paddock in the middle of the crop, and was quite green when other varieties were ripe. The rabbits and hares found it out and lessened the yield considerably. None of these wheats are rust-resisting. Ranjit was grown for the second time; it yielded well in 1900 in moist sandy soil, though it is apt to go down when ripe, the straw being rather weak; it has a close head hard to thrash, is early, rust-resisting, and yields well, the grain being long and good. All the wheats were manured with mineral super. at rate of 1cwt. per acre.

POULTRY FOR FARMERS.—The Chairman read a paper to the following effect:—

The farmer should first learn how to manage poultry by starting with a few birds and giving them every attention. He should increase his flock each year until he has as many as he can properly keep and attend to. He should provide proper houses and yards for the birds; it is a great mistake to allow them to roost and lay about where they please. Every egg laid should be secured fresh; if the fowls are running at large, nests are often found containing a number of eggs, some of which may be several weeks old. These cannot be used if the farmer is honest; often, however, they are included with others and sold to the hawk, an action that is sure sooner or later to recoil on the farmer, as well as on those who are innocent of fraud. Poultry must be properly attended to if they are to be made to pay. No farmer would expect to get a profit from his cows or sheep if he neglected them as he usually does his fowls. See that the chicks get the proper food and feed them where they cannot be molested by the old birds. Give them every care when young and you will find them to mature into strong healthy birds. For laying purposes a quick-maturing bird that will lay at least twelve dozen eggs a year is wanted. There is a remunerative market for good table birds all the year round, and a certain market for eggs, but you cannot get a champion layer and a champion table bird in one. There are, however, some birds that by careful selection and breeding now possess both qualities in a high degree, one of the best of these being the Orpington. Of the purely laying strain, probably the Minorca takes first place. In selecting birds for improving his flock, the farmer wants pure-bred birds, sound in health, and possessing the characteristics desired, not necessarily fine feathers and large combs and exhibition birds. Utility before

mere beauty should be aimed at. A few years ago most poultry-fanciers bred for fancy points but this is not the case now, as most breeders devote attention to egg production or table birds, according to the class, besides working to standards of appearance. Many farmers appear to hold the opinion that one fowl is as good as another, which of course is a mistake. Each of the breeds has some special quality. The same farmer would think it absurd to talk of using a thoroughbred horse in the plough, or a draught horse for hunting or riding, yet they fail altogether to see that the breeds of fowls differ equally in their uses. Every farmer can, if he will, rear good birds that will bring in a fair income. One thing must be borne in mind—the flock should only be increased as experience increases. Many think that they can make 1,000 birds equally as profitable as 100, but in most cases this is a mistake. The question of feeding does not receive the attention it should. Fowls are naturally eaters of both grain and insects, so that to secure the best results they should receive a variety of foods. On large farms, and where the available land permits, a plot of lucern or kale should be grown, and the fowls allowed free run on it. It makes excellent summer feed for the fowls, besides being also a good hunting ground for insects.

The Hon. Secretary considered there were great possibilities in the improvement of poultry. There were too many fowls on many farms, compared with the feeding received and the land they have to run on. The result was disease of all kinds affected the birds. Under such conditions it was no wonder that the farmer came to the conclusion that poultry did not pay.

MUSTARD.—Mr. W. Schubert reported having sown four acres of good clean fallow land to white mustard. Owing to the long dry spells of weather the seeds were pinched and small. The expenses of harvesting were considerable, as it had to be reaped with a hook and hand-thrashed. Owing to being pinched the seed was only worth 8s. per bushel. The result of the experiment was as under—

Twenty-four bushels seed at 8s.	£9 12 0
Cost of harvesting	6 5 0
Rail freight	0 15 0
Net return	2 12 0

Land alongside yielded 17bush. of wheat per acre, so that the four acres would have netted £7 if sown to wheat instead of mustard.

Colton, February 1.

Present—Messrs. W. J. Packer (chair), W. A. Barnes, M. S. W. Kenny, H. A. Kleeman, and R. Hull (Hon. Sec.).

SUGGESTIONS FOR IMPROVING BUREAU.—It was considered that a revival of interest in the Branch was necessary before the members could discuss the improvement of other Branches. It was thought that increasing the membership to twenty might be advisable in some districts, but considerable difficulty is experienced in getting even a fair attendance here.

TAKEALL.—It was agreed that takeall was worse after a wet autumn, that a wet spring following a dry winter caused an increase, that heavy chocolate flats were most liable, though other lands are sometimes affected. It is seen sometimes in patches on new land; manure does not appear to check it; fallow is not practised, as the land drifts badly; rolling appears to be of no benefit; all wheats are equally affected. Members consider that badly-affected land should be left out of cultivation for four years and grazed with sheep.

Elbow Hill, February 5.

Present—Messrs. C. G. Ward (chair), H. Dunn, F. J. Brooks, J. Rhen, W. Ward, W. Spence, W. Beinke, S. Pike, G. C. Dunn (Hon. Sec.) and three visitors.

TAKEALL.—Questions from Central Bureau discussed, but nothing done, as the disease is not prevalent to any extent in this district.

STRANGLES.—This complaint was reported to be troublesome this season.

BEST WHEAT.—Members considered Gluyas wheat the most suitable for this district.

TESTING WEIGHT OF WHEAT.—A discussion took place on system of testing wheat adopted by buyers, *i.e.*, the taking of small samples and weighing same. Members considered this method unsatisfactory; farmers who have offered their wheat to different buyers have been given different weights as the average of their wheats. It was agreed that farmers should insist on the Imperial bushel measure being used.

Rhine Villa, January 25.

Present—Messrs. H. Mickan (chair), W. Farey, G. Lewis, T. Edson, and J. Vigar (Hon. Sec.).

EXPERIMENTS WITH MANURES.—The Hon. Secretary reported on experiments with fertilisers carried out under direction of the Inspector of Fertilisers (see February issue). Members were of opinion that 84lbs. of super. per acre was sufficient for this district, as the heavier dressings did not pay for the increased outlay.

RED RUST.—The Hon. Secretary tabled several samples of affected plants from South Rhine district. Some varieties, notably Purple Straw and Steinwedel, were much pinched; but Dart's Imperial and Brown Tuscan were but slightly affected. Crops in this neighborhood escaped injury.

GREEN FODDER.—Mr. Edson tabled samples of beetroot and lucern, the latter being 18in high, the second cutting from seed sown in September.

GRASS GRUBS.—Several members reported damage by grubs in grass paddocks, giving the land the appearance of having been burnt. The Hon. Secretary wished to know whether the grubs were likely to affect the wheat crops next year. [There is considerable risk of this. If the soil is not too heavy, roll the patches with heavy roller.—GEN. SEC.]

Gumeracha, February 10.

Present—Messrs. D. Hanna (chair), A. Moore, A. F. Lee, W. Cornish, J. Kitto, W. Jamieson, W. A. Lee, W. V. Bond, H. W. Nosworthy, J. Monfries, and T. W. Martin (Hon. Sec.).

SUGGESTIONS FOR IMPROVING BUREAU.—This matter was discussed. Members did not consider that increasing the membership would increase the utility of the Branches. [Cannot members suggest how to increase the attendance and the usefulness of the Branches?—GEN. SEC.]

Mannum, February 7.

Present—Messrs. J. G. Preiss (chair), J. W. Haby, R. P. Scott, B. Baseby, J. W. Walker, E. A. Ramm, F. E. Schuetze, and W. H. Quartly (Hon. Sec.).

SUGGESTIONS FOR IMPROVING THE BUREAU.—Members are of opinion that paper read by Mr. Grashy at the Annual Congress contains many points worthy of consideration. Unlimited membership of Branches was advocated, and it was thought that, if found necessary, there would be no objection to a small membership fee to meet cost of *Journal* and incidental expenses.

WHEAT EXPERIMENTS.—The Chairman reported Theiss wheat to be very hardy, though somewhat late. It produced a good sample. Hawkes' Clubhead returned a good sample, and was worthy of further trial. Members wished to know if it was rust-resistant. [No.—GEN. SEC.] Hanna barley returned 40lbs. from 2lbs. sown; but the sample reaped was not equal to that sown, probably owing to the long dry spells.

Gawler River, January 24.

Present—Messrs. A. M. Dawkins (chair), H. Roediger, J. Hillier, J. Barrett, F. Roediger, W. Clark, and A. Bray (Hon. Sec.).

TAKEALL.—The Chairman and Mr. H. Roediger agreed that this was worst in dry seasons, and on loose, friable, and crabhole land. Unfallowed and late fallowed land was more liable than early fallow. It appeared on both manured and unmanured land. Rolling does not prevent it. Mr. Dawkins said a change to oats checks the disease, and a good crop of oats may be grown on land where wheat has failed. Mr. Roediger had dug the patches after takeall had appeared in the crop, and had not had it again on these patches.

BEAUTIFYING THE HOME.—Mr. Barrett made some remarks on this subject. A man must be industrious and have some spare time if he is going to improve the home. Tree-planting beautifies the home, but for shade purposes should not be planted nearer than two chains from the home garden. A boxthorn hedge improves the appearance of the home, and is a good breakwind. Good stone outbuildings are an improvement to the farm, but involve considerable outlay. A good wife was the best help a man can have in beautifying the home. Members generally agreed with Mr. Barrett. The olive and boxthorn were considered good hedge plants round the house, but they were great robbers of moisture. Members considered that all farmers could easily and cheaply construct gates, which were a great improvement on slip panels.

Stockport, January 31.

Present—Messrs. F. Watts (chair), D. G. Stribling, J. Smith, J. Smith, jun., T. Megaw, T. Howard, J. F. Godfree, and J. Murray (Hon. Sec.).

RUST-RESISTANT WHEATS.—Mr. Watts read a paper on "Is it Advisable to grow Rust-resistant Wheats?" The ravages of red rust during the past season naturally gave rise to this question. On all hands one hears of the qualities of these varieties as resisting the ravages of rust. While admitting that it may prove profitable to grow a small area of such wheats, he was adverse to paying a high price for seed to go in for growing them extensively. Experience of the past has proved that these early wheats have many defects, the chief of which is their liability to degenerate. Later varieties have proved more susceptible to rust this past season, owing to the deficiency of rainfall causing a late start. This, he believed, was the worst factor in causing the rust to do so much damage. His advice was to stick to the old well-known varieties, as, with an early favorable seedtime, they ran little or no risk from rust. [Mr. Watts apparently overlooks the fact that some of the very early wheats have suffered from rust, and that there are several proved rust-resisting wheats that are midseason or later in their ripening, and are prolific and of excellent milling quality.—GEN. SEC.] Several members agreed that in a good year the old wheats gave better returns than many of these newer rust-resisting wheats; but thought it would be well to sow some of the latter each year. [Are the members aware that quite a number of farmers growing these rust-resistant wheats reap from 16bush. to 26bush. per acre, according to season and location?—GEN. SEC.]

Mount Gambier, February 8.

Present—Messrs. W. Mitchell (chair), J. Watson, G. Bodey, T. H. Williams, J. Dyke, D. Norman, sen., J. Kennedy, W. Barrows, M. C. Wilson, J. C. Ruwoldt, D. Norman, jun., and E. Lewis (Hon. Sec.).

MANURING GRASS LAND.—The Chairman applied superphosphate at rate of 100lbs. per acre; also bonedust to grass land at Kalangadoo. The effect of the super. was immediate and remarkable; bonedust was not yet showing any advantage. He believed a less quantity than he used would be of considerable benefit to the grass. Mr. Williams said the value of manure was well shown on Mr. Altschwager's land at Tantanol. Where it had been applied the grass grew well, and the cattle now showed no signs of impaction, whereas formerly it was difficult to keep cows owing to stiffness of the joints and impaction developing. Impaction caused more deaths than other complaint in the South-East, and he was convinced that absence of nutriment in the grass had a lot to do with it. The grass that grew on rich and well-manured land was more full of substance, even when dry, than grass on poor land, and impaction was prevented. Members referred to the preference for grass on manured land shown by stock, also to the craving for phosphates illustrated by their fondness for bones.

RUTHERGLEN FLY.—Discussion on the damage done by this insect took place. In some parts potatoes were reported to have almost recovered, in others the crop will be reduced one-half. Mr. Dyke said the flies were thick on his wheat, and the sample was much shrivelled; they ruined his mangels, turnips, carrots, and early potatoes. He had tried lime, bluestone, and tar mixtures, but they had no effect on the insects. Onion crops have also been considerably damaged. Absence of frost was thought to have favored the increase of the pest.

HORSE SCAB.—Mr. Williams said that on a recent visit to Kingston he had inspected a number of horses affected by scab, a disease caused by an animal parasite. The Chairman said this disease was at one time very common on the coast country. Mr. Ruwoldt had also seen it on the legs and body near Adelaide; they used an application of lard and blacklead with satisfactory results. Mr. Dyke advised using kerosine and tar.

Mallala, February 14.

Present—Messrs. G. W. Bischof (chair), F. M. Warden, S. Temby, J. Nairn, J. Nevin, A. F. Wilson, A. Moody, G. Marshman, H. B. Moody, M. H. East, J. Churches, W. R. Stephenson (Hon. Sec.), and one visitor.

IMPROVING THE USEFULNESS OF THE BUREAU.—The Hon. Secretary was in favor of an annual election of members to the Central Bureau, and for increase in membership of Branches. Courses of lectures by professional men would be valuable, but at this juncture too costly. He favored extending the issue of the *Journal of Agriculture*, and also circulating agricultural libraries. Mr. Nevin thought it a mistake to have arbitrary rules as to number of Branches and of members; if membership was unlimited there should be a small charge for the *Journal*. He was in sympathy with the idea of circulating libraries. Mr. H. B. Moody considered the Bureau was doing excellent work, and did not think radical changes necessary. He was afraid increasing membership would lead to less interest being taken in the work by members. The question of expense was an important one. A library of agricultural literature would be of great assistance. Mr. Marshman favored an increase of members, though it was possible to have too many Branches; a circulating library would be beneficial. Mr. Nevin, however, thought otherwise. The

Journal of Agriculture was of great value, as it contained so much information in a condensed form. He would increase the membership of Branches, and would like to see the young men take more interest in the work. Mr. Warden thought the Bureau was doing good work; the Adelaide daily papers were deserving of praise for publishing the Bureau reports. He did not think they would find the proposed circulating library of much benefit. The Chairman favored increase of membership and the library. It was unanimously resolved that this Branch favors an increase of membership where circumstances warrant it.

HARVEST.—The average for the district was estimated at 10bush. of wheat and 1 ton of hay.

Bowhill, February 1.

Present—J. T. Gregory (chair), E. P. Weyland, A. Dohnt, N. P. Norman, P. Semmler, J. McGlashan, F. H. Baker, J. G. Whitfield (Hon. Sec.), and one visitor.

WHEAT EXPERIMENTS.—Mr. Baker sowed 11ozs. Marshall's Hybrid wheat and reaped 2lbs. 13½ozs. Silver King returned 4½lbs. from 13½ozs. of seed. These were grown on unmanured fallow land.

DOMESTIC ECONOMY.—Paper by Mr. Blessing, of Port Germein Branch, on this subject, as printed in February *Journal*, page 625, was read by the Chairman, and in many respects was agreed with by members, who thought that as farmers there was room for improvement in the direction of economy.

Port Lincoln, February 17.

Present—Messrs. R. Sullivan (chair), G. Dorward, J. O'Shanahan, J. Richardson, E. Chapman, and Dr. Kinmont (Hon. Sec.).

RUST-RESISTANT WHEATS.—Mr. O'Shanahan found Ward's Prolific wheat practically rust-proof, but it was hard to thresh, did not yield well, and the grain was not of a good milling character. Marshall's No. 3 had proved rust-resistant and a good milling wheat; from forty-six acres he had reaped 200 bags of this wheat. Members considered that throughout the district the yield has been reduced one-half by rust.

COMPLETE HARVESTER.—Mr. O'Shanahan considered this machine a great labor saver; he had harvested 130 acres with one this year. It was not suitable for hilly country; on level ground he found it required four good horses to work it properly.

ONIONS.—Mr. Richardson tabled some Brown Spanish onions grown locally on land manured with superphosphate. The crop yielded at rate of 4 tons per acre; the samples tabled averaged ½lb. each.

PASTURE LAND.—Mr. Dorwood reported on splendid area of pasture land between Port Lincoln and Franklin Harbor; spear grass and tussock grass were abundant, and there was enough feed for 20,000 sheep for six months if water was available.

Mount Compass, February 8.

Present—Messrs. M. Jacobs (chair), F. Slater, F. McKinlay, H. McKinlay, W. Gowling, A. Sweetman, J. Jenken, E. C. Good, R. Cameron, S. H. Herring, C. S. Hancock, A. J. Hancock (Hon. Sec.), and one visitor.

RUTHERGLEN FLY.—This Branch desires that description and illustration of the Rutherglen fly should be published in the *Journal of Agriculture*.

HOW TO MAKE MEETINGS MORE ATTRACTIVE.—Mr. F. McKinlay initiated discussion on this subject. He thought it would be a good plan to discuss matters referred to in the *Journal of Agriculture*. Mr. Jenken thought members should give their experiences in the papers they read, and not copy from books; paper read should be fully discussed, and the writers should not take too much notice of a little keen criticism. Mr. H. McKinlay thought if every member would endeavor to bring forward some matter of practical interest the meetings would be far more instructive. Mr. Gowling believed it would improve the attendance if ladies were asked to attend the meetings. Mr. Herring thought it would be a good plan to arrange for an exhibition of garden implements, as it would be of great benefit to the gardeners in the district. The Chairman agreed, but would make the show include local products, such as preserves, cookery, needlework, &c., and would have a picnic in connection with it. A committee was appointed to make necessary arrangements for holding a picnic.

Kingston, February 1.

Present—Messrs. W. W. Pinches (chair), T. Redman, T. Pinkerton, D. Flint, E. M. Flint, and F. S. Wight (Hon. Sec.).

MARRAM GRASS—Decided to make inquiries concerning price which marram grass could be landed at Kingston for planting on sand drifts.

Cherry Gardens, February 11.

Present—Messrs. W. B. Burpee (chair), C. Lewis, J. Lewis, T. Partridge, A. Broadbent, and C. Ricks (Hon. Sec.).

CODLIN MOTH PARASITE.—Mr. C. Lewis reported that the wasp that destroyed the caterpillars of the codlin moth was keeping the pest down in his garden.

BRANCH SHOW.—Arrangements in connection with show of produce and home industries, to be held at Cherry Gardens on March 20, were discussed.

Saddleworth, February 14.

Present—Messrs. J. H. Frost (chair), G. Bengier, J. P. Daley, F. Plant, J. Eckermann, W. Hannaford, W. S. Heaslip, F. E. Waddy, J. Scales, D. H. Adams, T. H. Neill, F. Plueckhahn, F. Coleman (Hon. Sec.), and one visitor.

EXPERIMENTAL PLOTS AT ROSEWORTHY.—Reference was made to the report in February *Journal* of experiments in broad-cast and drilled and quantity of manure plots. It was thought that the value of these experiments was lost through neither factor being constant, the quantity of seed and manure varying in every case.

BURNING OF STUBBLE.—It was questioned whether, in view of so much manuring with mineral phosphates, the burning of stubbles would not so lessen the natural increase of vegetable matter in the soil that, sooner or later, the land would be impoverished. It was pointed out that the manurial value of the straw was very low. Where self-sown crop was desired burning is necessary; some members would burn for feed, others thought the old stubble if not too thick helped the young feed, and stock eat a little of it. Among the members generally the burning of stubble was not practised or recommended, except under special circumstances.

MERINO SHEEP ON THE FARM.—The Hon. Secretary read the following paper on this subject:—

The combination of sheep-farming with agriculture has been recommended by practical men for many centuries. Fitzpatrick, in his "Boke of Housbandry," writes in 1523:—"An hosbande cannot well thryve by his corne without he have other cattell, nor by his cattell without corne. For else he shall be a hyer, a borrower, or a beggar, and because that shepe, in myne opynyon, is the most profytablest cattell that any man can have, therefore I pourpose to speke first of shepe." Some of the advantages to be gained by keeping sheep in this district are:—(1) In early spring sheep will feed bare the paddock before following. (2) Their manure in a very soluble form is distributed evenly, or in extra quantity on the higher and probably poorer ground. (3) They assist in keeping the land, and especially the fallows, clean, when there is no time to scarify before the oats and weeds run up to seed. (4) Should the early sown wheat become "proud," sheep are the best stock to feed it down, and generally the wheat is benefited by being fed down; it tillers better. (5) They firm the ground without puddling it, and the wheat plant likes a firm seed bed. (6) Sheep will make a better job of cleaning up the flag and bottom growth on the stubbles than other stock. (7) Where sheep will keep in condition and grow good sound wool cattle would starve. (8) They save the butcher's bill. When once your paddocks are sheep-proofed and provided with water sheep need little attention. Sheep have this advantage over cattle, they return wool as well as meat, and when you breed with a definite object in view, as we always should, the advance, more or less, towards that ideal is a source of much interest and satisfaction, giving that real zest and love of work on the farm which dispels what is often referred to as the monotony of farm life. Having decided to keep sheep, we have to decide upon the breed. My experience is with Merinos; hardy sheep, particularly well adapted to our hot, dry climate, where, with little feed, they grow the best of wool, and also good, sweet mutton, short in grain, and tender, a little darker than the Down sheep, but none the worse for that. If quality of mutton is the only object, probably South Downs deserve first place, then Shropshires; if quantity, Lincoln, or Lincoln cross; and for early lambs, a cross between Dorset Horn or Shropshire and Merino. Make your selection, and aim at improving it up to your ideal. If Merino and good wool are your choice, select the breeding ewes before shearing; and here we have an advantage over the large grower, because we can handle and personally examine every ewe. Select those with close wool along the back, good breadth across the thigh and down to the hock, woolled to the hoof if young sheep (this last as a guarantee of being well-wooled elsewhere); rather avoid a long staple, as it is of no extra value on account of length, and has a tendency to become open and let in dirt. A medium staple, dense as you can get it, even in character, with least quantity of waste, will pay best. Cull out ewes with "devil's grip"—that peculiar gluey matted patch high up on each shoulder. Raise the sheep you fancy best and that do best on your land. I do the bulk of the wool-classing in the yard before shearing, marking the culls with raddle on nose. Begin shearing before the clover bur gets on to the wool, say middle of October. Avoid second cuts; skirt from the fleece all stained, burry, matted wool, and the fuzzy wool round the face; fold the sides of the fleece to lap over down the middle, then roll from the end; do not tie. I put six fleeces in a layer, and nine or ten layers in the bale, making a weight of 3cwts. to 3½cwts. The small grower cannot classify much—cull from the bulk every objectionable fleece. I always separate the bellies from the pieces. Place a neat stencil brand, preferably a short name, on the top of the bale, with number and description of contents; aim at making your brand as reliable in every way as possible, as it pays to do so. Go through your ewes again after shearing, when you can see the form much better. Select those with good shoulders, rounded ribs, and broad quarters; avoid leggy sheep. Choose your rams carefully with good masculine points, strong where the ewes may be weak. I don't think it pays us farmers to breed rams if we can hire good ones. Sixty ewes to the ram is enough; you then get a more even lot of lambs. I put the rams in with the lambing flock the second week in November, and take them out second week in February. Set up a high standard, and aim to breed up to it. You may never, as the late John Murray, of Mount Crawford, said, reach your standard of excellence; but if you can get as near as he did you do well indeed. Give the ewes the best feed and shelter you have during lambing in April and May. Choose a mild, bright day early in July for tailing; use a clean knife, and avoid frothy weather. The lambs will be ready for freezers in December, weighing 35lbs. net. Cull your young sheep freely, but don't keep old sheep; remember, a good sheep costs no more to feed than an inferior one. I find it pays to breed my sheep, selling the wethers, and often wether lambs. The ewes 4-tooth and over return a lamb as well as their wool. My sheep during the past five years cut of average of 9lbs. 12ozs. wool, crediting lambs' wool to ewes, and returned 6s. 2d. per head per year net at the wool sales. But the important point is what do the sheep return per acre? My sheep pay full rental value for the scrub land which is exclusively used by them; but on stubbles and cultivation paddocks lying out they have only what is left after the cows and horses have had their pick, except in the spring months, when feed is abundant. I find that during the past five years my sheep paid approximately 6s. per acre per annum on the land lying out on which they

grazed. Fencing is a very important consideration. If you fence, and I recommend it, fence well; look on it as an investment of capital. I use six wires, the top one a 12 x 3 barb wire. The cost is from £25 to £45 per mile, according to whether much or little old wire is again used, and whether the work is done by contract or not. Next to fencing water is needed. A dam recently scooped, 80ft. square at t.p. 9ft. deep, with a capacity of 164 000galls. in excavated part, and 90,000galls. more when full up bank to overflow, a total of 254,000galls., cost £25 8s. 8d. For autumn feed I have found sorghum *saccharatum* very useful for putting condition on sheep before the cold winter set in. One favorable season—1898—on about seventy acres I fattened 540 wethers, putting them on the sorghum on February 22nd, and trucking them to Adelaide at end of April, when one week part of a lot of 200 of them topped the market for fat Merinos. The lot netted a profit of £53, in addition to which I had my young sheep running on the sorghum the latter part of the time. This paddock (ninety-four acres) gave the best return of all the fallow under wheat, the following harvest averaging 19bush. 34lbs. clean market wheat, with no other manure than the sheep droppings. With introduced grasses and fodder plants suitable for sheep, I have as yet had no success. I am hopeful that a barless medick—*medicago scutellata*—may yet prove a useful sheep plant, not the least valuable part of which is the dry twisted seed vessels with seeds enclose.

In reply to a question, Mr. Coleman said he would recommend the keeping of sheep on 300 or even 250 acres, fenced into small paddocks, believing it would pay to sheep-proof the fences on such a farm. Mr. Plueckhahn advised the use of good rams; he sought a good carcass as well as wool, and kept Merinos. The Chairman favored keeping even a few sheep to save the butcher's bill; the skins were always worth something. Frequent change of paddocks was advised for sheep.

EXHIBIT.—The Chairman tabled sample of Champion oats grown by him this season, yielding 30bush. per acre and weighing 44lbs. per bushel.

Morphett Vale, February 4.

Present—Messrs. L. F. Christie (chair), A. Pocock, J. Bain, T. Anderson, and A. Ross Reid (Hon. Sec.).

WINDBREAKS.—The disastrous effects of the recent storm caused discussion on this subject. Mr. Bain said that a block of pines on the west side of the vineyard had proved of considerable benefit. Mr. Anderson stated that when they remembered that a storm like the last was experienced only once in a lifetime, while the trees would be robbing the ground constantly, and also affording a harbor for destructive birds, the vineyard was, on the whole, better without such protection.

MANURE EXPERIMENTS.—Mr. Christie reported on experiments with manures. (See report by Inspector of Fertilisers in March issue *Journal of Agriculture*.)

Yorke town, February 8.

Present—Messrs. J. Koth (chair), G. Domaschensz, A. Jung, B. Lloyd, T. Corlett, C. H. Davey, J. H. Thomas, S. Vanstone, G. Bull, A. E. Anderson, J. Latty, and J. Davey (Hon. Sec.).

WHEAT EXPERIMENTS.—Mr. Domaschensz reported as follows on experiments with different kinds of wheat last season:—Clubhead—Grew well, does not go down, about 3ft. high, stools fairly well, badly rusted, grain pinched, rather late ripening; drilled in 9ozs. seed, which yielded at rate of 19½bush. per acre. Ranjit—Grows very fast, but weak and thin in straw; almost free from rust, not much affected by hot wind, grain filled splendidly; 9lbs. drilled in yielded at rate of 19½bush. per acre. Silver King—Stools well, is strong in the straw, ripens fairly early, little rust, suffered from hot winds, grain small; 7lbs. drilled in yielded at rate of 21bush. per acre. Majestic—Stools out

well and is strong in the straw; suffered from hot winds and ripened too rapidly, the grain being pinched; no rust on this variety, which yielded equal to 15bush. per acre. These wheats were manured with mineral super. at rate of 56lbs. per acre. Early Para—Yielded at rate of 10bush. of splendid grain; very little rust. Grey's Early—Good grain, little rust; 13bush. per acre. King's Early—Very good grain, little rust; 11bush. per acre. Marshall's No. 3—Entirely free from rust, hot winds caused it to ripen too quickly, gave best results; 21bush. per acre. Steinwedel, 10bush.; Purple Straw, 12bush.; and Dart's Imperial, 13bush., were all much affected by rust, but the grain sold at ruling prices. Mr. Latty tabled samples of the following wheats:—Gluyas, free from rust, yield light through being sown very late; Silver King and Marshall's No. 3, very little rust, yield 11bush. and 16bush. per acre respectively; Grey's Early and Petatz Surprise, little rust, 13bush. and 14bush. respectively; Allora Spring yielded about the average. Mr. Jung said Silver King and Majestic wheat were from rust on his farm.

MANURES FOR WHEAT.—Mr. Anderson sowed Marshall's No. 3 at the end of May on fallow land; two acres manured with 1cwt. super. yielded 23½bush. per acre; two acres receiving 2cwts. super. per acre yielded 27bush. per acre.

Orroroo, February 14.

Present—Messrs. W. S. Lillecrapp (chair), J. Moody, G. Matthews, J. Scriven, M. Oppermann, E. Copley, W. Robertson, and T. H. P. Tapscott (Hon. Sec.).

TAKEALL.—This complaint is practically unknown in this district.

EARLY AND LATE SEEDING.—The Chairman wished members' opinions on question of sowing wheat early or late. Most members favored sowing some portion early, so that it would get the benefit of the early rains if any fall. The early-ripening wheats should be put in last, as they mature so quickly.

IRON TROUGHING.—The Chairman asked best method of preserving iron troughs. He had tried paint, but it was a failure. Some members advised heating the trough and painting with coal tar once a year, taking care to scrape any rusty places. The Hon. Secretary recommended tar and pitch mixed and put on as hot as possible. He had used this method for several years with satisfaction, treating the troughs once a year.

LOOSE TIRES.—The Hon. Secretary has for past three or four years treated his buggy wheels to a bath of hot oil, as illustrated in October, 1898, issue of *Journal of Agriculture*. He found it very satisfactory, practically saving the cost of cutting the tires besides preserving the wheels. A gallon of oil will do a set of buggy wheels three times.

Millicent, February 6.

Present—Messrs. H. F. Holzgreffe (chair), S. J. Stuckey, H. Warland, W. B. Crouch, H. Oberlander, G. Mutton, and R. Campbell (Acting Hon. Sec.).

GREEN MANURES.—Mr. Oberlander stated that lupins sown on sandy lands in Germany were utilised for fodder for sheep. The sheep did not care for it, however, until they got used to it. It was decided to obtain blue lupin seed for trial.

TAKEALL.—Members had not much acquaintance with this trouble. Some considered the farmers themselves were often the "takeall," others that deficiency in plant constituents was the cause. The cockchafer grubs were also responsible for some of the damage attributed to takeall.

CONFERENCE.—Matters in connection with South-Eastern Conference, to be held at Millicent on March 19, were dealt with.

PESTS.—Mr. Crouch tabled weed for identification, and Mr. Bird some hawthorn berries affected by disease. Mr. Oberlander showed apple with brown spots on the surface, which he thought was caused by ravages of the Rutherglen fly.

TOMATOES NOT SETTING.—Mr. Oberlander reported that plants of Heath's Improved tomato from Bureau seed were making good growth, but very few fruits had set, and these were not ripening well. Members generally reported similar trouble with tomatoes of late years. Some members attributed this defect to the fact that the seed was generally saved from the latest ripened fruits. [A very natural theory; we know that by saving the earliest seed of any fruit each year we can get earlier ripening strains, why not the reverse?—GEN. SEC.]

Booleroo Centre, February 17.

Present—Messrs. W. H. Nottle (chair), N. Clack, S. T. Parsons, J. Clack, A. Milne, Geo. Sargent, J. H. Repper, J. Albinus, Dr. Steven, J. Arthur, F. McMartin (Hon. Sec.), and four visitors.

WHEAT EXPERIMENTS.—The Chairman tabled samples of World's Wonder, Hawke's Clubhead, and Steinwedel wheat. Sown under same conditions as other kinds, the yield from the two former wheats were not promising enough to be considered suitable for the district. Mr. Clack said World's Wonder yielded very well with him, but was much shrivelled.

SHEEP ON FARMS.—The Chairman called attention to statement in report of Naracoorte Branch (December issue of *Journal*) by Mr. Hassler that Northern farmers did not keep sheep because they were too much bother. Members considered the remark a libel on the Northern farmers, besides which it displayed ignorance on the point in question. Sheep are now kept on the majority of farms, and members are of opinion that in this district there are now more sheep kept than when it was a sheep run.

BUNT.—Mr. Clack read a paper on this subject. He had seen and tried different methods of pickling wheat during about fifty-four years' experience in England and South Australia, and preferred bluestone pickle to any other. He used ½ lb. of bluestone to the bag of wheat, dissolving the bluestone in a gallon or more of boiling water. He pickles on the floor, doing 8 bush. at a time, taking care to turn and mix it thoroughly. Any of the pickle that runs from the heap is swept back with a broom. It is best to have the pickling-place hollow in the middle to prevent the escape of the pickle. A good concrete floor is very suitable. After pickling put the wheat in a heap and cover with old bags or other material to keep the warmth in, and leave it over night. Last year he had some very dirty seed of Steinwedel wheat; he used a little more bluestone and more water in pickling, and only found one "smutty" head in the crop. By pickling in a cask and using cold water the pickle got contaminated with the germs, and they could not expect anything else but a "smutty" crop. [If the pickle is any good at all the spores left in the cask will certainly be destroyed quite as effectively as those on the wheat grains.—GEN. SEC.] He considered it paid to take every care with seed wheat, as not only did the careless farmers have to submit to a reduction in price, but the reputation of our wheat was likely to suffer. Mr. Sargent used cold water when pickling, bagged his wheat as soon as pickled, and never was troubled with bunt. Dr. Steven asked Mr. Clack his reason for so strongly advocating pickling with warm water. The Chairman and Mr. Parsons used a tub or cask for pickling in, and were never troubled by bunt.

Meningie, February 15.

Present—Messrs. J. Williams (chair), A. J. Myren, W. J. Botten, H. May, T. W. R. Hiscock, Thos. Joy, C. J. Shipway, and H. B. Hacket (Hon. Sec.).

TAKEALL.—This was attributed by some members to poverty of the soil. Heavy dressings of clay or limestone marl was mentioned as a successful treatment for takeall. Mr. Williams had noticed it on land where wombats had burrowed out the limestone marl, the roots of the plant being attacked by a fungus growth of a blue color. It was worse in a wet season.

SMUT IN BARLEY.—Mr. Linn thought smut in barley resulted from sowing seed in wet weather. Messrs. Scott and Joy thought ploughing in the seed increased the risk of smut. Mr. Tiller did not think wet or dry weather made any difference, as the seed was infected; he found pickling with salt water from the lagoons or with new lime prevented the trouble. Mr. Joy had sown smutty barley on low-lying ground of a salty nature, and the crop was clean. From similar seed sown in sandy soil the crop was half smut. In neither instance was the seed pickled. Several members had noticed grass affected by smut.

RED RUST.—Members noticed that red rust was more prevalent in wet seasons than dry, and that it was worst when foggy nights and warm sunny days were experienced at the time the wheat was just coming into head.

POTATOES.—Mr. May tabled nice sample of potatoes. He found Redskins did best in this district. From 1cwt. of setts 7cwts. to 8cwts of tubers were harvested. The plants were in rows 2ft. apart, and 2ft. 6in. apart in the rows. Those planted closer together did not yield so well. The results were considered satisfactory for this district.

IMPROVING THE BUREAU.—Mr. Grasby's paper was discussed. The Hon. Secretary did not think the adoption of the suggestions would do much good. He was opposed to increasing the membership. What was wanted was more energy and enthusiasm of members. Increasing the membership would increase the work of the secretaries and the cost of the *Journal*. It was useless putting the *Journal* in the hands of those who did not value it. Some members were not altogether free from blame in this connection. They ought to get the young men interested in the work of the Bureau, but they did not seem to take much interest in the more serious side of life. Light employment in the city, with ample opportunities for indulging in sport and amusements, seemed to be their main object. Other members agreed that more activity of present members was required, and that it was not advisable to increase the membership, as suggested by Mr. Grasby.

IMPACTION.—This disease was reported in cattle, and it was agreed that the dry rough feed was the main cause.

Mount Remarkable, January 23.

Present—Messrs. C. E. Jorgensen (chair), W. Lange, T. P. Yates, H. N. Grant, W. Foot, and J. O'Connell (Hon. Sec.).

TAKEALL.—Mr. Jorgensen had seen cocky chaff spread on takeall patches and burnt, with the result that the patches of ground remain free from this trouble for several years.

STOCK COMPLAINT.—Mr. Lange reported having lost four cows within a week. They were first affected by stiffness in the forequarters, lose the use of the lower jaw, and are unable to eat—the mouth remains open and the tongue protrudes. He endeavored to get the Stock Inspector to visit his farm without success, and used therefore the remedies recommended in the *Journal*. He

first gave them 20ozs. epsom salts in warm water, followed by drench of thin oatmeal, but it did no good. Two cows treated to 16ozs. salts and 1oz. each of gentian, ginger, and carbonate of soda in a quart of warm water have recovered. [Give the cows boiled linseed and moist bran two or three times a week to keep the digestive organs in condition. A tonic should also be given. Mix half a pound of sulphate of iron with 20lbs. salt and 20lbs. bonemeal, and give a handful in the feed occasionally, or place it where the cows can get at it.—GEN. SEC.]

Strathalbyn, February 17.

Present—Messrs. M. Rankine (chair), B. Smith, G. Sissons, R. Watt, P. Cockburn, H. H. Butler, P. McAnaney, G. M. Meikle, A. Rankine, G. J. Reid, W. M. Rankine, and J. Cheriton (Hon. Sec.).

SOUTHERN CONFERENCE. - It was decided that the Annual Conference of Southern Branches be held at Strathalbyn on April 10.

MEMBERSHIP.—A proposition favoring an increase in the membership of Branches was carried.

TAKEALL.—Mr. McAnaney read a paper on this subject. Four years ago nearly half the crop on a small area of six acres of fallowed land was taken by takeall. The wheat died off in patches, but what was left yielded a splendid sample. The land was manured with 1cwt. of super. per acre, and had not been under crop for many years previously. The rest of the crop on fallow land was similarly affected, and he was disposed to attribute the trouble to insect attacks on the roots. A friend of his told him that many years ago takeall was very prevalent in the hills, and the late Dr. Muecke, who investigated the trouble, put it down in the end to insects damaging the roots. If the affected plants are pulled up it will be found that there are practically no roots left.

RED RUST.—A long discussion on this subject took place. Members were of opinion that the spread of the disease was entirely dependent upon atmospheric conditions when the plant is in ear, and that it was advisable to grow early wheats, as they were less liable to injury; also, that the proved rust-resistant varieties should be tried.

FERTILISERS FOR WHEAT.—Members expressed the opinion that the use of 1cwt. of manure per acre had doubled the crops in this district. It was also agreed that every farmer should study the condition of his land, and use more or less manure, as his experience showed to be necessary.

BRANCH MEETINGS.—It was decided to ask that the editor of the *Journal* to publish the date of each Branch meeting, in order to save expense and trouble of notifying each member. [This plan will not work. Most members seem to require a direct personal reminder a few days only before meeting is to be held.—GEN. SEC.]

Naracoorte, February 14.

Present—Messrs. S. Schinckel (chair), J. Wynes, W. Buck, G. Wardle, A. Caldwell, E. R. Peake, J. G. Forster, A. Johnstone (Hon. Sec.), and two visitors.

BOTS.—Mr. Wynes called attention to spread of the botfly, and after the meeting several members were shown horses in the streets upon which the eggs of the fly were found. The Chairman said he had recently examined a number of horses, and found upon fully 50 per cent. of them the eggs of the botfly. He read from an American publication particulars regarding the use of sage tea and tansy as a means of ridding the animals of the bots. [The statement that

the American Agricultural Department has recommended the decoction of tansy has been denied. There is no known treatment that will remove the bots from the stomach that will be harmless to the horse.—GEN. SEC.] As the fly lays her eggs on the neck, flanks, and legs of the horse, from whence the young maggots, or nits, are licked by the animal, an oiled rag should be kept in the stable, and during the season when the flies are about it should be used regularly to rub down the horse. Thorough grooming is the best preventive. If the horses are clipped under the jaws and arms there is less protection for the eggs.

SPARROW DESTRUCTION.—The Chairman called attention to the damage done by sparrows. Unless something were done to check their increase it would soon be impossible to profitably grow some crops. There should be more action taken by the residents to destroy the sparrows. Of all the poisons he had tried he found Pitt's poisoned wheat the best. It was not injurious to poultry. Mr. Forster also had had best results from this preparation. Mr. Wardle said more co-operative action was required. He was doing all he could to destroy them; but his neighbors provided hedges for the birds to build in. The sparrows did a vast amount of damage in the wheatfields.

POTATOES.—Mr. Buck reported on experiments with new varieties of potatoes. Owing to the unfavorable season the results were poor. Ehlers returned 16lbs. from 2½lbs. planted; Thiele, 14lbs. from 2½lbs.; and Professor Maercker, 13lbs. from 2½lbs. None of them were equal to Red Skins or Flour Ball.

Caltowie, February 18.

Present—Messrs. N. E. Hewett (chair), G. Petatz, J. Neate, G. Potter, J. H. Both, A. Kerr, J. G. Lehmann, A. McCallum, F. Lehmann (Hon. Sec.), and four visitors.

SUGGESTIONS FOR IMPROVING BUREAU.—Mr. McCallum thought Mr. Grasby's suggestions unworkable, but agreed that the Branches should have a voice in the election of members of the Central Bureau. Mr. Hewett favored increase of membership. Where the population warranted it he would have twenty or twenty-four members. Mr. Lehmann pointed out that increasing the membership meant increasing the work of the Hon. Secretary. Mr. Kerr opposed increase of membership; also opposed circulating library. The latter would only mean more expense, and little good would result. They all get the *Journal of Agriculture*, which should be sufficient in this direction. A motion in favor of increase of members was defeated by a large majority.

Woodside, February 17.

Present—Messrs. R. Caldwell, M. P. (chair), W. Drogemuller, G. F. Lauterbach, R. W. Kleinschmidt, W. Rabach, C. W. Fowler, A. Lorimer, N. Schrader, C. Pfeiffer, J. D. Johnston, R. P. Keddle, and A. Hughes (Hon. Sec.).

TAKEALL.—This question was discussed. The disease was worst in wet seasons, and increased after rain in spring. The wettest and heaviest land was most affected, and rolling before the crop springs is considered to increase the damage. Early varieties seem more susceptible than late. It is a number of years since takeall was reported to any extent in this district.

BRANCH BULL.—The Holstein bull purchased by the Branch was reported to be in good health and growing well.

VISIT TO NEW ZEALAND.—The Chairman gave an interesting account of his visit to New Zealand.

Mount Bryan East, January 25.

Present—Messrs. W. Bryce (chair), G. Taylor, B. H. K. Dunstan, E. Wilks, and J. Honan (Hon. Sec.).

SEASON.—Better returns were obtained last season from land ploughed and sown than from fallowed land. The grass in this district, particularly barley grass, is badly infested by smut, so much so in many cases that stock will not eat it. Many farmers are short of water for stock.

DAIRYING.—On January 29, Mr. G. S. Thomson, Dairy Instructor, delivered a very interesting address on dairying, there being a large attendance of farmers and others.

Inkerman, February 18.

Present—Messrs. W. Board (chair), A. Tozer, W. A. Hewett, J. Lomman, C. H. Daniel, F. C. Smart, Jas. Sampson, C. E. Daniel (Hon. Sec.), and one visitor.

WHEATS TO GROW.—The Hon. Secretary initiated a discussion on Harvest Notes. Of the different wheats he had grown he preferred Neumann's, King's Early, Early Para, and Purple Straw. It was a mistake to grow all early wheats, as, even in this dry district, the later wheat often gave the best returns, and he would advocate sowing at least one-fifth of Purple Straw. For hay, either of the early wheats mentioned mixed with Cape oats were good. He thought every farmer should grow oats and barley, as both yielded well here, and for pigs and poultry both were worth growing. He favored the stripper for harvesting. The wheat chaff made a good fodder, and if they used the harvester he did not think much of it would be gathered. Mr. Board strongly condemned the sowing early of early-maturing wheats, as they were so liable to damage by frost. He would not sow them until the end of April. Mr. Tozer said Neumann's wheat did best with him last season; he also spoke highly of Bearded Purple Straw, a variety brought out by himself. Mr. Lomman also spoke well of Neumann's wheat; he would not sow any late wheat unless they had very early rains. Mr. Sampson thought well of Early Para and Marshall's No. 3. Mr. Smart said Rattling Jack gave him the best return, and was free from rust; King's Early was also good. He strongly advocated cleaning all seed wheat a second time, pickling with bluestone, and sprinkling with dry salt. Mr. Kennedy favorably reported on King's Early and Smart's Early.

Nantawarra, February 21.

Present—Messrs. Jas. Nicholls (chair), T. Dixon, jun., G. Belling, E. J. Herbert, A. F. Herbert, E. Pridham, R. Uppill, S. Sleep, H. J. Spencer (Hon. Sec.), and one visitor.

STANDARD SAMPLE OF WHEAT.—The question of the fixing of the standard bushel was discussed at the previous meeting, and it was resolved that in the opinion of this Branch the words "being bought and sold at full market price on which no allowance has been made" should be omitted from the circular sent out by the Chamber of Commerce asking for samples of the season's wheat. It was pointed out that if wheat was sent in under this condition, the average could never be reduced, and must in fact increase each year.

WHEAT EXPERIMENTS.—Discussion took place on report of experiments carried out at Mount Templeton public school. Members were of opinion that the value of the experiment in sowing plump and shrivelled seed was lost, owing to the seed being selected from a bulk sample. To give a proper test,

shrivelled wheat from a shrivelled sample and plump wheat from a plump sample should have been selected. It was agreed that under certain favorable conditions shrivelled grain would produce a good crop, but it was always preferable to sow plump seed. Members agreed that in practice it was found that best results were obtained when the seed was sown not deeper than 2in. Most members favored sowing 30lbs. of late wheat and 45lbs. of early wheats per acre. Some, however, would sow up to 45lbs. of late wheats and 60lbs. of early. It was agreed that early wheat should be sown late and late-maturing wheats sown early in the season. The late wheats in a favorable season give higher returns than the early wheats; but experience has shown it was not wise to rely on one class alone, some of each should be sown.

Penola, February 8.

Present—Messrs. W. Miller (chair), D. McKay, L. W. Peake, S. B. Worthington, E. F. McBain, E. A. Stoney, and F. Ockley (Hon. Sec.).

SPARROW DESTRUCTION.—It was decided to support the action of the local district council in endeavoring to enforce the Sparrow Destruction Act, and to write urging the council to continue the vote for the destruction of sparrows.

WHEATS.—Mr. McKay tabled fifteen samples of wheat grown on poor land at Wando Vale by Mr. Moodie, who was using different kinds of fertilisers.

Quorn, February 19.

Present—Messrs. R. Thompson (chair), Jas. Cook, J. B. Rowe, F. Herde, G. Walker, G. Brewster, and A. F. Noll (Hon. Sec.).

IMPROVING USEFULNESS OF THE BUREAU.—Mr. Grasby's paper discussed. Increase of membership of Branches was not approved. Reading and lecture courses and circulating libraries were considered good if they could be carried into effect. It was suggested that much good would result if the Professor of Agriculture would occasionally suggest subjects and questions for consideration by the Branches.

BATHURST BUE.—Mr. Cook called attention to the quantities of this plant (*Xanthium spinosum*) growing in the district. He had called the local district clerk's attention to it, and was told that the council did not bother about the weed as it was good food for sheep. It was decided to draw the attention of the local council to the necessity for destroying this weed.

Carrieton, February 20.

Present—Messrs. W. J. Gleeson (chair), J. V. Harrington, J. W. Cogan, W. Steinke, F. Vater, H. Menz, and J. W. Bock (Hon. Sec.).

HARVEST NOTES.—Mr. Bock stated that the rainfall at Yanyarrie for the season was only about 6½in., and the wheat only showed well above ground in August and was too late to come properly to maturity. His average was only 1bush. per acre. Other members reported similar experiences, but Mr. Gleeson stated that on a piece of ground under the Moockra Range, which he drilled in and manured with about 36lbs. of super. per acre, he obtained 5bush. per acre, notwithstanding the very poor rainfall. He also tried heavier dressings of manure, but the crop blighted; some portions were drilled in without any manure, but the crop was no better than where broadcasted. He was of opinion

that with a season at all favorable a light dressing of super. will prove profitable. The best varieties grown in this district are Allora, Bartlett's Crossbred, Purple Straw, Steinwedel, and Early Para; the latter, however, was badly pinched. Petatz Surprise weighed well, but did not yield so well as the others.

POULTRY.—The Hon. Secretary read a paper on this subject, and considerable discussion ensued. Several members reported poultry tick to be prevalent. Mr. Cogan used kerosene (one part) and water (three parts) with success, burnt his fowlhouse, and caused the birds to roost in the trees. Mr. Harrington found sheep dip a good remedy; the tick were in the trees as well as in the sheds. Mr. Gleeson said there was a fair profit in poultry, both for eggs and table birds, and poultry-breeding had proved a great help to many farmers.

Redhill, February 18.

Present—Messrs. D. Lithgow (chair), A. McDonald, H. Darwin, A. A. Robertson, H. E. Kelly, F. Wheaton, D. Steele, R. T. Nicholls, and J. N. Lithgow (Hon. Sec.).

TAKEALL.—Members have not had much experience of takeall, but were of opinion that working the land when moist was a preventive of trouble.

WHEAT EXPERIMENTS.—Mr. Nicholls had sown World's Champion and Hawke's Clubhead wheat from Central Bureau, but as he learnt they were largely grown in the district, he did not trouble to reap them separately. He thought the Bureau should not send out wheats already in the district; other members agreed. [Will Mr. Nicholls say how I am to know whether any particular wheats are grown in the district. He did not apparently know himself that these wheats were grown by other farmers around him, yet expects us to know not only what wheats have been tried in his locality, but in every other locality in the State.—GEN. SEC.]

Clarendon, February 17.

Present—Messrs. J. Piggott (chair), J. Pelling, W. Spencer, R. Hilton, W. Raisbeck, H. Payne, A. A. Harper, J. Juers, A. Harper, and J. Wright.

IMPROVING USEFULNESS OF BUREAU.—Considerable discussion on this subject took place. A resolution favoring an increase of membership of Branches to twenty-five was carried.

LICENSING OF STALLIONS.—Mr. Raisbeck initiated discussion on this subject. It was decided to deal with the matter at next meeting.

Crystal Brook, January 25.

Present—Messrs. J. C. Symons (chair), G. Davidson, W. Natt, A. Hamlyn and W. Hamlyn.

TAKEALL.—Mr. A. Hamlyn found takeall to be worse in wet seasons and on light sandy lands. He first saw it forty years previously. Affected land was not fallowed, but ploughed dry and sown early. Rain in spring does not appear to influence the disease; rolling after the plant commences to cover the land does no good. He had seen it equally as bad on land manured with stable manure as on unmanured land; where bonedust and guano were used takeall was not so bad. His experience was that takeall was largely due to bad farming practices.

DAIRYING.—Mr. Natt read a paper on "Dairying and Pig-breeding" to the following effect:—

A good deal has been said about the improvement in dairy herds, but his opinion was that they were going back in many cases. Like many others he had been crossing the Shorthorn cows with the Jersey bulls, and the progeny were only about half the size of the mothers; if they kept on in this way their cows would soon be no larger than goats. He had a good deal of experience with cows, and found the Shorthorns the best, but they use a bull from a good milking strain, and keep only the heifers from good milkers. He had known plenty cows whose origin or breed it would be difficult to determine that were good milkers. He would not put a Jersey or Alderney bull with Shorthorn cows; the Ayrshire cross on Shorthorn cows had been successful with some people, but the reverse cross was not so good. Some farmers are strong believers in color and condemn white cows; he had one white cow that produced 18lbs. of butter per week, and others that were good milkers. Very much, however, depended upon the feeding and treatment. Cows without shelter in cold weather soon fall off; the yield also depends largely on what goes in at the mouth. Dairying and pig-breeding naturally go together. Judging from his experience of the past ten years, twenty good cows will yield butter worth £200 per annum, and the milk will fatten pigs worth £75 to £100. Pigs in South Australia always seem to be at extreme prices, either low or high, and no regular fair price. For porkers he preferred the Essex boar on Berkshire sows. Essex sows are not profitable breeders; they were too fat and did not litter well. A good Berkshire should rear ten to eleven pigs at a time. He had a sow which reared fifty-five pigs in two years. Sows with young should be well fed after the first four days. Young pigs do well on bran mixed with milk; at six weeks old they should be weaned and have as much milk as they can drink. If there is not enough milk give a little soaked grain. For the last three weeks of fattening stir pollard in the milk. The porkers should be ready for market in four months and weigh 60lbs. to 80lbs. Rearing pigs for bacon did not pay; the man who does not keep cows has little chance of making a profit from pigs unless there is waste of wheat in the stubbles; pigs are good gleaners, and will fatten quickly on corn if they have plenty of water.

Some diversity of opinion existed as to the most profitable breed of pigs. All agreed that the short-faced Essex boar mated to Berkshire sows produced good stock, but the long-faced Essex were not appreciated.

Davenport, February 13.

Present—Messrs. W. J. Trembath (chair), A. McDonald, W. Hodshon, sen., J. Roberts, F. A. Pybus, T. Tottman, T. McDowell, and J. E. Lecky (Hon. Sec.).

SAND DRIFTS.—Mr. Roberts stated that he had noticed a native bush which grew fast in dry weather and was spreading on the sand drifts. It appeared to hold the sand in check. Mr. Hodshon knew this bush, and said that cattle would not touch it at first, but afterwards eat it readily. Mr. Pybus stated that it flourished in the driest seasons on the sandhills near the beach. It was decided to send specimen down for identification.

FOWL TICK.—Mr. Pybus tabled a simple and effective trap for tick in fowls. With regard to the size of poultry yards, the general opinion was that overcrowding was a mistake, but a difference existed as to space per bird.

POULTRY FARMING.—The Chairman made a few remarks on the subject. He asserted that, based on scientific principles, the industry would and did pay well. Careful attention should be given to details, as upon this the whole success of the industry depended. He contended that it was the duty of all to contribute towards establishing this hitherto neglected industry on a sound and permanent basis. Advantage should be taken of every point proved by older communities, and applied to our own methods and conditions. Victoria had done this with great benefit to her expanding commercial interests. America had proved beyond dispute the value of poultry-farming as a national industry. Mr. D. F. Laurie had stated that the industry in Victoria had been valued officially at £2,000,000, a sum which exceeded the total value of the wool export of that State. Several other figures were presented, and the

Chairman concluded his remarks by saying what America had achieved and Victoria is achieving South Australia can achieve, and the spirit of emulation evoked by their experiences would result in a practical and profitable demonstration of the importance and value of the industry. Mr. A. McDonald read a few notes on "Utility Breeds." He said there would always be contention with regard to the best breed for profit. For egg-production alone the Minorca, Leghorn, Andalusian, and Hamburg breeds are highest. He showed by means of statistical tables that these breeds were beyond doubt the best laying strains. With regard to general utility, the ideal fowl is one that is hardy, matures quickly, grows a fair size, and lays at least 130 eggs a year. In this class the Wyandotte and Orpington are considered the two best. There are also the Dorking, Langshan, Houdan, and Plymouth Rock. He showed by means of statistics that the Dorking and the Houdan hold their own with the Wyandotte and Orpington as all-round birds, but it is claimed that the former two do not do so well in wet or cold climates as the latter. Wyandottes, Langshans, Orpingtons, and Plymouth Rocks do well in most climates. Mr. J. B. Jamieson, of Victoria, writing to him in reference to the Wyandotte, stated that he found that fowl the best all-round bird. Pullets commence laying at from five to six months, and cockerels at four to six months old make excellent table birds, one bird being sufficient for dinner for six persons. Mr. Laurie had also recommended this breed. They are moderate eaters and very tame. The same remark applies to Orpingtons. Leghorns had proved to be good layers, and the Black Orpington a capital all-round bird. The latter has been successfully crossed with the Minorca, Plymouth Rock, and Langshan, the progeny combining good laying qualities with weight.

Balaklava, February 8.

Present—Messrs. P. Anderson (chair), G. Reid, A. Manley, W. H. Thompson, W. Smith, A. W. Robinson, J. Crawford, J. Vivian, E. Hams, G. C. Neville, A. Hillebrand, and E. M. Sage (Hon. Sec.).

SUGGESTIONS FOR IMPROVING THE BUREAU.—Discussion on Mr. Grasby's paper took place, and it was resolved that there was no necessity for any such drastic alterations in the Bureau as suggested, members being of opinion that there was plenty of scope for improvement under present conditions. It was also considered that the rule as to distance apart the Branches should be was not too strict, and that membership of fifteen was sufficient, as it is very seldom that more than two-thirds of that number attend the meetings. It was suggested that a new rule might be adopted providing that to retain his seat on the Branch a member should attend at least six meetings during the year. [This might work under favorable conditions, but it would be better to make it read that any member failing to attend half the number of meetings held during the year be liable to be struck off the roll.—GEN. SEC.] It was resolved that members take it in turn to be responsible for the chief business of the meeting.

FALLOWED LAND DRIFTING.—Mr. Robinson wished to know how to prevent fallowed sandy soil from drifting. He had twenty acres drifting badly. The Hon. Secretary said he stopped the drift in his garden by covering the soil with old chaff, straw, &c. He did not believe in the sand being allowed to drift, and it seemed strange that in this district some people were trying to make it drift, as they contended that it made the adjoining lands produce better crops, while in other countries, and even in the southern parts of this State, thousands of pounds were being spent to prevent and reclaim these drifts. Some members considered that nothing is gained by fallowing this sandy soil;

it was better if left until just before seeding to plough the land. Mr. Smith fallowed his sandhills, and let them drift as much as they liked; at seedtime he drilled this sandy land without any further cultivation, and during past year some portions yielded 20 bush. per acre, while the average was fully 15 bush. Members generally were of opinion that the drift of sand in this locality was likely to be a serious matter in the future.

WHEAT EXPERIMENTS.—Mr. Thompson tabled Carmichael's Eclipse wheat. This was a good milling wheat, stands well, does not shake out, is fairly early, and this year was quite free from rust.

Burra, February 14.

Present—Messrs. F. A. S. Field (chair), Jas. Scott, R. J. Needham, Hon. J. Lewis, M.L.C., and R. M. Harvey (Hon. Sec.).

PRESENTED BULL.—The Chairman reported that the Hon. J. Lewis, M.L.C., had presented the Branch with an Alderney bull.

WOOL CLASS.—Arrangements have been made with Mr. Geo. Jeffrey, wool instructor, School of Mines and Industries, to form a wool-sorting class at the Burra.

STOCK DISEASES.—The general health of stock in this district is satisfactory; but further north there have been many deaths from impaction of the omasum and paralysis, caused by want of nourishment in the dry feed and the absence of phosphatic salts. The disease has been most prevalent on farms where the land has been continuously cropped, but there has been a marked improvement where phosphatic manures have been used. Inspector Needham recommended drench and removal of affected stock to fresh pastures. At Nantawarra several cases of rickets had occurred amongst horses and cattle. The joints of knees and fetlocks swell, bones are brittle, and the animals become crippled. The growth of young cattle is seriously affected and they become stunted. The disease is attributed to absence of phosphate of lime.

Hahndorf, February 22.

Present—Hon. A. von Doussa, M.L.C. (chair), Messrs. C. Bom, C. Jaensch, H. Spoehr, T. H. Sonnemann, P. Schubert, J. C. Rundle, D. J. Byard (Hon. Sec.), G. Monks (Forest Range), and visitors.

CODLIN MOTH.—Mr. Geo. Monks read a paper on "The Codlin Moth and how to Deal with it," to the following effect:—

All growers will agree that the codlin moth is the worst pest our fruit producers have ever had to contend with. I think all right-thinking growers will admit that the pest has come to stay, that it has to be fought in some way or other, and that the growers are the ones who have to fight it; in any case until science discovers some better way. But before any success can be expected it is absolutely necessary to know something of its life and habits, and every fruit producer should study this interesting little insect for himself. This can easily be done to a large extent by getting some of the larvæ of the moth and confining them in a bottle and watching the changes which take place. There are in our climate two or three broods during the fruit season; that is two or three generations. There are a lot of erroneous ideas as to how the caterpillars get into the fruit. The egg is laid by the moth upon the fruit or leaves and hatched there, and as soon as this takes place the tiny caterpillar begins its work of destruction by boring into the fruit, from which it emerges in about three weeks a full-grown insect, seeking a shelter to change into a moth; this of course only continues during the fruit season, the last brood seeking shelter for the purposes of hibernating. There is also a very wrong notion in existence in the minds of some that the moth lays the eggs in the bloom. I would just like to point out that in the hills the first caterpillars are not found in the bandages till about the middle of December, and seeing that it only takes about three weeks for the caterpillars to develop from the time of hatching, what would become of the eggs if laid at flowering time, or what would be the fate of the insect if hatched? Either one or the other or both

must perish—the egg because of too long exposure; the caterpillar because it cannot live without fruit, and there would be none for it. I would also point out that, with a few exceptions, the borings are visible from the outside of the fruit; the exceptions being simply on account of a very open and wide calyx, indicating that the caterpillar goes from the outside to the inside of the fruit.

Now we will deal with the mode or modes of catching and killing the pest. I think I am in a position to speak with a good deal of authority upon this matter, having had several years' experience in my own orchard, as well as in the orchards of upwards of 1,000 other growers in the Hills; and I say unhesitatingly that the growers in that area, with only a very few exceptions, are relying too much upon the bandages as a means of trapping the codlin moth. I will go still further and say that there are a very few who regularly pick off the infested fruit for the purpose of destroying it. And as this is the best means so far as is at present known of keeping the moth under control, there is absolute necessity for regular picking off the infested fruit at least once a week and destroying it, from the beginning to the end of the season. It is certain the caterpillars can be caught in the fruit, but if allowed to come out it is not certain that they will shelter in the bandages, particularly if other shelter is afforded by sheds and fences, and all sorts of rubbish such as grass, sticks, and fruit-suckers under and around the trees. The bandages are a good help, but they are only a secondary means of trapping the caterpillars compared with picking off the fruit. It is true that under very favorable conditions a large percentage will be caught by that means, but the fact remains, too big a percentage escapes, as is proved by experience every season.

It is very much to be regretted that up to the present no united action on the part of the growers to endeavor to cope with the pest has taken place, not even with respect to a proper system of bandaging and scraping the trees, without saying anything about examining cases, bags, and destroying the infested fruit; and until this does take place the pest is bound to increase year by year to a very marked degree.

Up to the present time it cannot be said that spraying has been a success for the destruction of the codlin moth, although some people claim that it is effective. I have recently visited and inspected Mr. George Laffer's orchard at Belair. He has sprayed some of his trees two and some three times for codlin moth, and although he has been fighting the pest for a number of years and has suffered considerable loss in the past, I was surprised to find so few infested apples on his trees, and he claims that spraying is the cause of this.

To sum up briefly, if it is true that by picking off the infested fruit at regular intervals it is possible to keep the pest in check to such an extent that it is possible to get a good percentage of clean fruit for marketing purposes, and if it is also true that the bandages although a great help are not sufficient, it follows as a matter of course that if the fruitgrowers are going to make the industry a profitable one they must unitedly take it up and work with a will in order to be successful. But this cannot be done with the present type of tree in the hills; they must either be reduced in size or replaced by a different style of tree altogether, as it is impossible to pick off infested fruit from such, and they cannot be properly scraped and the stems made so that there is no shelter for the caterpillars to hide in.

Considerable discussion followed, and it was pointed out that years ago, when the pest was confined within narrow limits, the fumigation of cases and bags under Government supervision was advocated by this Branch, and had this been done it might easily have been eradicated. [And even before the codlin moth was introduced here I endeavored to waken the fruitgrowers to the danger of its introduction, but without success. The question now is not "what might have been done," but "what must we do now to save the industry?"—GEN. SEC.] It was generally agreed that no real good could be done while there are so many old, gnarled, and unwieldy trees in the local orchards.

Port Elliot, February 22.

Present—Messrs. O. B. Hutchinson (chair), H. Green, sen., W. E. Hargreaves, J. Brown, J. R. Coote, C. Gosden, H. Pannell, and E. Hill (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary's report showed that during the year ten meetings were held, the average attendance being 8.9 members. Six papers on matters of practical interest were read, and the meetings generally had been instructive. Several homestead meetings were held during the year, and these afforded both instruction and pleasure to members and visitors. Mr. J. McLeod was re-elected Chairman, and Mr. J. Brown elected Hon. Secretary for ensuing year.

Minlaton, February 15.

Present.—Messrs. John Anderson (chair), J. D. Mayer, James Anderson, M. Twartz, W. Honer, R. G. Newbold, E. Correll, D. G. Teichelmann, J. Martin, A. McKenzie, H. Boundy, J. McKenzie (Hon. Sec.), and one visitor.

WHEAT SAMPLES.—Mr. Mayer reported having sent sample of shrivelled wheat to the General Secretary for his opinion as to its value for seed. Mr. Molineux wrote that while it might do all right under favorable conditions as to moisture, &c., if the soil was not in good condition at seeding the shrivelled grain would not stand so much chance as sound seed. The Hon. Secretary tabled standard sample of wheat received from Chamber of Commerce. Members were strongly of opinion that the sample should be fixed earlier in the season, as a large quantity of wheat up to the standard, but lower than last year's standard, was sold at a reduction on market rates. Members were also of opinion that buyers did not give as much attention to clean samples as they should.

DAIRYING.—Mr. E. Correll read a paper in which he advocated the use of the separator where several cows are kept by farmers, and contended that dairying will, under judicious management, pay on the Peninsula. He tabled sample of ensilage and mentioned that his cows were fond of it. The paper was well discussed, the use of the separator where three or more cows are kept being favored. Impaction of cattle was also discussed. The complaint is very prevalent in the district. Epsom salts and oil, and gunpowder and phosphates, were mentioned as remedies. Most members agreed that change of pasture and diet, with occasional doses of salts, was the best preventive action.

BURNT BONES.—Mr. Twartz asked whether burnt bones made as good a fertiliser as crushed bones. [No. Burnt bones will contain only a trace of nitrogen, while ordinary bonedust will contain $3\frac{1}{2}$ per cent. to $4\frac{1}{2}$ per cent. of nitrogen. Crushed burnt bones would perhaps give quicker results than coarse raw bonedust.—GEN. SEC.]

Amyton, February 20.

Present.—Messrs. Jas. Gum (chair), J. Kelly, W. Gum, T. Gum, J. Gray, G. Wheadon, R. Brown, W. Mills, W. Hawke, and two visitors.

HON. SECRETARY.—Mr. F. Mullett was appointed Hon. Secretary in place of Mr. H. B. Turner, who has left the district.

PINNAROO.—Discussion on matters in connection with inspection of land at Pinnaroo were considered. Members thought the Government should offer every facility for farmers from the dry districts to inspect the country.

TAKEALL.—Considerable diversity of opinion existed amongst members as to cause of takeall. Generally this district is not much troubled with takeall, apart from patches on moist loamy soils, where the wheat dies off owing, it is supposed, to the ravages of grubs.

Pine Forest, February 11.

Present.—Messrs. F. Bayne (chair), J. Phillis, G. W. Barnden, and R. Barr, jun. (Hon. Sec.).

TAKEALL.—Discussion on this subject took place. The idea that overworking light land was conducive to takeall was refuted by the experience of members during past year, the land which had been worked most having least takeall. Mr. Phillis said a sure cure for the trouble was to grow a crop of oats.

THATCHING HAYSTACKS.—The Chairman referred to the necessity for properly thatching haystacks, stables, and sheds. Much less straw was required to keep out the wet, and the sheds lasted much longer when not crushed beneath the weight of material required to make them rain-proof when simply thrown on loose. It was difficult to find a good man at thatching, but he hoped that more attention would be given to the matter.

ANNUAL REPORT.—The Hon. Secretary's report showed that ten meetings had been held, the average attendance, five and a half members, being the lowest on record for the Branch. Three practical papers were read during the year, and several subjects of importance discussed. Matters in connection with the Field Trial Society receive considerable attention.

Forest Range, February 20.

Present—Messrs. J. Rowley (chair), W. Cherryman, R. E. Townsend, F. Mason, R. G. Rogers, R. Green, and H. H. Waters (Hon. Sec.).

TOBACCO.—Some discussion took place on the cultivation of tobacco, and the Hon. Secretary was instructed to obtain information on the subject.

FRUIT-GROWING.—Through the question box it was asked, "Which is the most profitable thing to plant when starting a new holding in this district?" Mr. Rogers said raspberries; if the location was suitable they would prove as profitable as any fruit, and some return would be obtained the first season. Mr. Townsend recommended planting apples, pears, &c., and bush fruits between; the latter could be removed when the trees came into bearing. It was also asked, "Is the present system of orchard inspection of any assistance in coping with the codlin moth pest;" and the answer of members was unanimously "No." Mr. Rogers tabled splendid samples of Fellenberg plum, a good all-round variety, being suitable both for jam and drying, and was a vigorous grower and a prolific bearer.

CULTIVATION AND MOISTURE.—It was asked, "What is the cause of finely-pulverised soil retaining moisture in a greater degree than soil less finely worked?" [Because in well-worked soils the capillary tubes that convey moisture from the subsoil to the surface are broken, and evaporation is to a certain extent prevented. Read paper in report of Gumeracha Conference, page 467, December issue.—GEN. SEC.]

Craddock, February 22.

Present—Messrs. R. Ruddock (chair), P. Gillick, J. Paterson, J. H. Iredell, W. Haggerty, J. Turner, J. H. Lindo (Hon. Sec.), and two visitors.

WHITE ANTS.—Mr. Gillick stated that white ants were destroying the salt-bush in some places by eating the roots. Mr. Haggerty found them in the roots and the hollow of the stems of wheat plants that had died. Mr. Ruddock thought the ants only attacked diseased or sickly plants.

GRAZING CAPACITY OF LAND.—Mr. Gillick read a short paper on the carrying capacity of the land in this district. The value of the land depends of course very largely upon the rainfall, and the value of blocks of ten to 20,000 acres is difficult to estimate, owing to the country being overrun with dogs, the blocks being so cut up by roads, creeks, and angles that it will not pay to vermin-proof fence, except in large areas. Shepherding the sheep would be too expensive, as the carrying capacity of the land would not exceed forty sheep to the mile in good season. If fenced, sixty sheep would do better than forty shepherded. The experience of the past twenty-four years demonstrates

that grazing alone on such small blocks would be ruinous even if the land was to be had rent free. Twenty thousand acres would not carry more than 1,250 sheep, the revenue from which at 6lbs. wool per head at 5d. per pound would be £156. From this deduct shepherds' wages and keep, losses from dogs and otherwise, rent, council rates, vermin destruction, and various other expenses, and there is nothing left. If, however, the land is vermin-proof fenced, it would be worth 15s. to 30s. per mile in good-sized blocks, as, besides sheep, a few cows, pigs, and fowls could be kept, and 200 to 300 acres put under wheat each year, favored spots subject to overflows from the creeks being selected. A family might be well supported on even a smaller area by farming and grazing combined. If the country is to be profitably occupied, it must be in blocks of not less than 10,000 acres, with vermin-proof fences. Care must be taken not to overstock. Land tax and council rates should be abolished on pastoral country outside the rainfall line. A long discussion ensued. Mr. Fitzgerald, a visitor, considered that Mr. Gillick had underestimated the carrying capacity of the country. In fair average seasons the best land would carry 100 sheep to the mile, but the land must be vermin-proof. It would take years for the country to recover from the effects of the recent drought. Members unanimously approved of the paper, and considered that Mr. Gillick had put the question of the occupation of the country in a "nutshell."

SEASON.—Members remarked on the extreme cool and dry summer experienced. No rain to run water into dams, &c., has been experienced since October 24th, 1901.

Port Broughton, February 24.

Present—Messrs. W. R. Whittaker (chair), J. Bates, J. Harford, E. Dalby, A. Button, W. Dalby, G. F. Pattingale, W. Tonkin, and Jas. Barclay (Hon. Sec.).

BEST WHEATS.—Discussion took place on best wheat to sow in this district that will escape rust and not lose grain by shedding; the voting being for Phillis Marvel, King's Early, and Steinwedel, in the order given. [How can Steinwedel wheat secure a place amongst varieties that do not shed the grain?—GEN. SEC.]

Wilson, February 22.

Present—Messrs. W. H. Neal (chair), J. Nelson, H. Ward, H. Need, H. T. Crossman, T. Barnes, W. H. Neal, jun., and A. Smith (Hon. Sec.).

PICKLING WHEAT.—Discussion on this subject took place, members being unanimous that 40zs. of bluestone to the bag of wheat was quite sufficient for the shrivelled grain that has been reaped this year, but 80zs. per bag was required for plump seed. Members would like to know if bunt is ever found in the crops grown at Roseworthy College Farm, where the soil is supposed to be properly prepared, and what pickle is used.

Hawker, February 20.

Present—Messrs. H. M. Borgas (chair), A. C. Hirsch, R. Wardle, J. W. Schuppan, and J. Smith (Hon. Sec.).

WHEAT HARVEST.—A very poor yield was obtained in this district, and the grain was much shrivelled. Baroota Wonder, Surprise (?) and Allora did better than other kinds. Mr. Wardle tabled sample of World's Champion wheat, very much pinched. The Chairman referred to the necessity for greater care in the

selection of seed wheat. He believed in cleaning the seed thoroughly to remove all the shrivelled seed. If plump grain only was sown he thought they would get better returns. Mr. Wardle cleaned his seed wheat twice, and last season sowed the plump and the shrivelled grain separately, but there was no difference in the yield, though the plants, where shrivelled wheat was sown, stood thicker. He believed that shrivelled seed from good straw would do better than plump seed taken from poor straw. Mr. Schuppan had seen good crop grown from shrivelled seed. Mr. Hirsch believed in thorough cleaning of seed wheat. They should be careful to keep the varieties pure, and to do this hand-picking of best heads was necessary. The best of wheat will deteriorate unless selection is made.

SHEEP IN THE NORTH.—Exception was taken to statement by Naracoorte members that sheep were not kept by northern farmers because they were too much trouble. Owing to dogs, sheep have to be yarded at night, and the constant travelling cuts up the feed and destroys it. It took about ten acres to keep a sheep, and unless the land is obtainable in larger blocks and vermin-proof fenced sheep will not pay.

SELLING WHEAT.—The Chairman read a paper on this subject. He considered the buyers were largely to blame for the present system the farmers have of preparing their wheat for market. If a farmer has an inferior sample he does his best to get rid of it. He may try one agent who will want to dock the price, so he goes to another, who, perhaps, because he wishes to get this farmer's custom, pays full price, and the wheat is mixed up with good wheat and sold as such. The practice should be stopped. If the agents would reject all inferior or badly-cleaned wheat farmers would soon learn that there was no hope of getting at the buyers. Wheat affected by rust cannot fetch top price. If farmers in those districts where wheat can be sent to one port direct for shipment would combine to ship the wheat themselves through the Farmers' Union it would pay them. By having each farmer's bags branded with special marks any unfair dealing would be detected. The farmers could be instructed as to branding the bags, to save as much trouble as possible at the port; and he could see no difficulty in the way of the farmers reaping the benefit of the full market price for wheat.

Holder, February 22.

Present—Messrs. J. Rowe (chair), H. Blizzard, J. Green, J. Jones, E. Jaeschke, J. Rossiter, F. G. Rogers, F. Starr, H. Vaughan, H. Tuck, J. J. Odgers (Hon. Sec.), and one visitor.

WHEAT EXPERIMENTS.—Mr. Green tabled sample of World's Champion wheat. The grain was rather pinched, but the yield was fair. It did not ripen until December, and was late for this district.

SUGGESTIONS FOR IMPROVING BUREAU.—Mr. Grasby's paper was discussed. Members were of opinion that appointments to Central Bureau should remain as at present, but officers connected with the Department of Agriculture should be members *ex officio*. It was also considered that the present constitution allowed the Branches to carry out any of Mr. Grasby's suggestions without the necessity for any reorganisation. It was agreed that the greatest improvement would be gained by the infusion of more energy on the part of the individual members. Members were not altogether in favor of increasing the maximum membership, as at present visitors can have practically all the advantages of the Branch members excepting in the matter of the *Journal of Agriculture*, and this was a financial question for the Government to decide.

INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

Number of Persons Registered and Found Employment by Government Departments and Private Employers from January 28 to February 25, 1902.

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youths	107	199	393
Masons and bricklayers	1	2	7
Stonecutters	2	—	2
Plasterers	8	—	4
Carpenters	6	3	6
Painters	3	1	—
Fitters and turners	2	1	3
Enginedrivers and firemen	1	—	—
Boilermakers and assistants	—	—	3
Blacksmiths and strikers	4	3	4
Iron moulders	4	2	5
Plumbers and ironworkers	2	—	—
Shipwright	1	—	—
Watchman	—	—	1
Coachman	—	—	1
Bootmakers	3	—	1
Married couple	—	—	1
Compositors	2	—	—
Apprentices	12	3	1
Cleaners	10	4	—
Porters and junior porters	6	7	1
Rivet boys	2	—	—
Totals	176	225	433

February 27, 1902.

A. RICHARDSON, Bureau Clerk.



Journal of Agriculture

AND

Industry.

No. 9. REGISTERED AS]

APRIL 1, 1902.

[A NEWSPAPER.

VOL. V.

NOTES AND COMMENTS.

The past six months have been very dry, and rain was anxiously looked for by many farmers to enable them to start operations for the season. March ends with splendid soaking rains over nearly the whole of the agricultural areas, and farmers will now push on rapidly with seeding operations. With this soaking rain there is considerable hope of a good grass season, as while the ground is still warm enough to cause rapid growth, it is too late to expect any hot spell to burn the grass when it springs. The dairying industry requires a good season to revive it again. The rain will doubtless cause considerable trouble to vigneron who have not finished operations, but on the whole the weather during the vintage has been decidedly favorable.

Owing to the grain of some of the earlier rust-resistant wheats grown in this State being dark in color and hard, objection was made by millers, and many farmers, who apparently do not acquaint themselves of what is going on in the way of the improvement of our wheats, still hold the opinion that the rust-resisting varieties are poor milling wheats, and are also poor yielders. This, however, is not the case; in fact, some of our best milling wheats are very resistant of rust, and there are quite a number of rust-resistant wheats that yield equally as well as Purple Straw or other similar kinds. There is no reason at all why farmers in every district should not secure wheats suitable to their particular conditions that will yield well and resist rust in a high degree. It is largely a matter of selection and experiment; neglect of this has cost the farmers of this State a heavy sum, and it remains to be seen to what extent the lessons of the past will be taken to heart.

Nearly all farmers who have used phosphatic fertilisers for wheat crops have noted the after effects on the grass, and it has been frequently stated that the carrying capacity of the land has been doubled. With this fact in view on all sides it is surprising that practically nothing has been attempted in the way of manuring of pasture land directly. There is little, if any, doubt that it will pay farmers who keep sheep and cattle, as not only will the quantity of feed

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be increased, but it will be of much better quality. Three-quarters of a hundredweight to 1cwt. per acre of any of the phosphatic manures in the market would cost from 4s. to 5s. per acre, and at the expense of, say, £1, a farmer could ascertain in a few months whether it was possible, by the expenditure of a few shillings per acre, to largely increase the carrying capacity of his pastures.

During the past five or six years Mr. E. Mazure, the well-known manager of the Auldana vineyards, has devoted considerable attention to the manuring of vines with decidedly satisfactory results. This year the returns from the manured vines are very gratifying, and the contrast between the vines receiving a heavy dressing, those receiving a light dressing, and those getting no manure was most marked. One portion received manure at the rate of 4cwts. Thomas phosphate, 4cwts. gypsum, 1½cwts. nitrate of soda, and 1½cwts. muriate of potash, and most of the vineyard just half this quantity. The manures, with the exception of nitrate of soda, were applied in the winter as soon as the vines were pruned, the nitrate being applied when the leaves had commenced to grow.

Professor Wright, of the West of Scotland Agricultural College, speaking on the question of manuring of the soil, recently referred to "the idea which prevailed so very widely, and which was essentially erroneous—that manures required to be varied in a great degree on account of the nature of the soil. As a matter of fact the manures that would grow a good crop of turnips in one part of the country would also grow a good crop in another, and while within narrow limits some variation had to be made to suit the nature of the soil, it was essentially and mainly true that manures ought to be adapted to suit the requirements of the particular crops and not of soils."

An intercolonial paper referring to the use of commercial fertilisers in South Australia, says, "This season the same fertilisers have been used for the first time by potato-growers—Senator Playford was the experimentalist in this case." We are sure that Mr. Playford will be as much surprised as anyone else to learn of the high distinction thus conferred on him. As a matter of fact there are scores of potato-growers in this State who use commercial fertilisers in conjunction with stable manure, and there are many who have to depend almost entirely upon such fertilisers as, owing to the distance from the city, they are unable to obtain any considerable quantity of stable manure. This *Journal* has contained numerous references to the use of fertilisers for potatoes, both in this State and elsewhere.

The reports from the War Office authorities concerning the Australian horses purchased for South Africa are of a very damaging character. The question arises, however, as to what extent the imperial remount officers are to blame for this unsatisfactory result. The average prices paid in various countries is given as £40 for English, £30 for American, and £16 for Australian cavalry horses, and for mounted infantry cobs, £25, £18, and £12 respectively. It will be seen, therefore, that in Australia the remount officers purchased only cheap horses; had they been authorised to pay as much as was paid in America there is no question but that a very much better stamp of horses could have been secured. Cavalry horses at £16 can scarcely be expected to be first class,

Readers of the *Journal* will be pleased to know that although our Dairy Instructor's term of engagement expired on February 28 he does not intend to leave South Australia for good. Mr. Thomson has gone on a visit to Europe and America to inquire into the latest progress in dairying science, and proposes returning to South Australia about November, having been engaged by the Minister for one year from that date. Although the past three seasons have been very severe on the dairying industry, there is no question but that it will assume considerably larger proportions than at present. Mr. Thomson has been of great service to our dairymen in the past, and on his return should do even better work.

The large amount of money circulated by a thriving dairy factory is illustrated by the report of the Glenormiston Butter Factory for the six months ending January 31. During that period the factory purchased nearly 2,000,000 galls. of milk, for which it paid £32,486. It paid its milk suppliers 9 56d. per pound. for butter fat, or equal to 4 08d. per gallon of milk. The cost of manufacturing amounted to 0 58d., and freight and selling charges to 1 12d. per pound. The total amount paid during the year for milk was over £52,000. The circulation of this amount in one district for milk alone spells prosperity.

The spread of phylloxera in Victoria is unquestionably of serious moment to South Australian vigneron. In addition to the outbreaks at Geelong and Bendigo, phylloxera has been found at Rutherglen, where about twenty vineyards are affected, at Tabilk, Nagambie, Mooropna, Ardmona, Toolamba, Heathcote, and St. Arnaud. The American resistant stocks are being cultivated at a number of places by the Department of Agriculture for distribution, and in the course of a few years there is little doubt that they will form breeding places for the insect in every district in Victoria. Although the importation of vines into South Australia is absolutely prohibited by law, thoughtless or careless travellers not infrequently bring cuttings with them, and it is the duty of every citizen to assist in preventing this. If we can keep out all vines and cuttings and plants from infested districts we may succeed in keeping out phylloxera for many years yet.

Many poultry-breeders complain that they obtain no better price for good table fowls than for ordinary mongrels, and the same complaint prevails in regard to eggs. It is suggested that both eggs and fowls should be sold by weight, and then there would be inducement to breed large, heavy, good-color table fowls, and to breed for eggs of a decent size. Why should turkeys be sold by the pound, and ducks, geese, and fowls be sold by the individual, or by the pair? or why should apples be sold by the pound and eggs by the dozen, irrespective of size?

At the annual meeting of delegates to the Northern Yorke's Peninsula Bureau Field Trial Society, held recently, it was reported that the land at Paskeville had been ploughed, and would be sown in due course. It was decided to hold a trial of cultivators, drills, and ploughs, at Bute, some time in August; also a show of draught, roadster, and trotting stallions. The various implement importers and manufacturers expressed satisfaction at the result of the decision to allow each farmer to judge for themselves which machines were, in their own opinion, best suited to their requirements.

ANALYSES OF FERTILISERS.

BY W. L. SUMMERS, INSPECTOR OF FERTILISERS.

The following table gives the results of the analyses of various samples of fertilisers obtained by myself during the current season. Where more than one sample of any brand has been taken, the analysis of each sample is given. The guarantee shown in the table is the registered guarantee furnished by the vendors to the Inspector of Fertilisers, as required by the Fertilisers Act.

Analyses of Samples of Fertilisers obtained by Inspector of Fertilisers.

Vendor.	Brand.	Water Soluble Phosphate.		Citrate Soluble Phosphate.		Acid Soluble Phosphate.		Nitrogen.	
		Guarantee.	Official Analyses.	Guarantee.	Official Analyses.	Guarantee.	Official Analyses.	Guarantee.	Official Analyses.
George Wills & Co.	Concentrated Super.	per cent. 190-0	per cent. 96-9	per cent. 8-0	per cent. 10-9	per cent. —	per cent. —	per cent. —	per cent. —
Do.	United Alkali Co. Super.	36-0	38-0, 37-6	—	—	—	—	—	—
Do.	do.	37-0	39-0, 38-5	—	—	—	—	—	—
Clutterbuck Bros.	do.	37-0	39-0, 38-5	—	—	—	—	—	—
Do.	do.	36-0	38-0, 37-6	—	—	—	—	—	—
Do.	Packard's Super.	36-0	40-0	—	—	—	—	—	—
Elder, Smith, & Co.	Lawes' Super.	36-0	39-2, 39-8, 37-4, 36-3, 37-3, 36-5	—	—	—	—	—	—
Gibbs, Bright & Co.	Ohlendorff's Super.	36-0	40-0 39-9 37-1	—	—	—	—	—	—
S. A. Farmers' Co-operative Union	do.	36-0	39-9, 37-1	—	—	—	—	—	—
Do.	United Alkali Co. Super.	36-0	37-6	—	—	—	—	—	—
Do.	do.	37-0	39-0, 38-5	—	—	—	—	—	—
Australasian Implement Co.	do.	36-0	37-3, 39-2	—	—	—	—	—	—
Do.	Ohlendorff's Super.	36-0	40-0	—	—	—	—	—	—
Do.	Shirley's Super.	36-0	39-5, 37-6	—	—	—	—	—	—
Wallaroo Phosphate Co.	Wallaroo Super.	36-0	37-7, 37-6	—	—	—	—	—	—
Norman & Co.	Cross & Co.'s Super.	36-0	37-8, 39-2	—	—	—	—	—	—

[illegible]

* Also contains 3.1 per cent. potash.
 † This concentrated super. contains 44.34 per cent. water-soluble phosphoric acid and 4.98 per cent. citrate-soluble phosphoric acid. For purposes of comparison, however, the figures in the above table are given in same terms as used for ordinary super.
 + Per cent. of acid-soluble phosphate not tested.

As far as the imported manures are concerned the season is practically over, but the local works are still busily employed. This season the imported manures came to hand earlier than usual—too early, a number of farmers complained; but there is little doubt that in the interests of all concerned it is better to have them early than late. As it is the welcome fall of rain will doubtless cause purchasers of the local makes of manures to ask for prompt delivery, frequently a matter of considerable difficulty, owing to it being often impossible to secure necessary railway trucks and sheets. It would doubtless pay farmers better to secure their supplies earlier in the season, rather than risk having to delay seeding operations on account of the difficulty in handling such immense quantities of fertiliser within so short a time. On more than one occasion during the present season vessels were in port at the same time with shipments totalling from 50,000 to 70,000 bags of manure; and when the local output is taken into consideration, it will readily be seen that a very large number of trucks are required to move this quantity. When, as has been the case in several seasons, the vessels arrive later than expected, farmers have, perhaps, to stop seeding operations for want of manure.

CHEESE-MAKING EXPERIMENTS.

By G. S. THOMSON, N.D.D., GOVERNMENT DAIRY INSTRUCTOR.

With a view to determining the value of hard-pressed cheese manufactured in South Australia, experiments were commenced in February, 1901, at the Murrumbum Dairy Factory, under the management of Mr. John Davidson. In the production of the cheese many tests were applied, and in no case was an opportunity missed in making the report a complete and valuable one. Examinations for butter fat were conducted, acid determinations were made throughout the process of manufacture, and the temperature and humidity of the ripening room was taken each day during the fourteen weeks the cheeses were maturing. The difference in weight of each sample was taken every seven days, thereby providing an accurate account of the extent of shrinkage by evaporation. After the cheese had been kept in the ripening-room from the dates of manufacture (February 14 to February 26) until July eight were sent to Adelaide for examination. These comprised two samples from the four days' manufacture and represented both systems, Acid and Cheddar, which are practised in the factories throughout the State. The consignment was forwarded early in August to Professor Drummond, Principal of the Dairy Department, College of Agriculture, Glasgow, with particulars as to manufacture and instructions to conduct a thorough practical examination and chemical analysis of each sample. In shipping the cheese four were placed in the refrigerating chamber of the steamer, while the other half were sent in the cargo hold at ordinary temperatures. The shipment arrived at its destination in October, and in the absence of Professor Drummond no examination was made until a week or two afterwards, thus making some of the cheeses over eight months old at the time of testing.

In dealing with the manufacture I will give the process in tabulated form and in the order of success gained:—

Order of Success.	Gallons Milk Used.	Time of Ripening.	Acid Test.	Temperature of Milk at Time of Renneting.	Time of Adding Rennet.	Time of Coagulation.	Temperature Heated to—	Time of Heating.	Time Settled in Whey.	Pounds of Curd.	Time of Salting.
		min.		degs. F.	a. m.	min.	deg. F.	min.	h. m.		
No. 1—Cheddar	160	20	0.20	87	9.5	65	100	35	2 15	204½	4.10
No. 2—Acid ..	211	28	0.18	86	9.50	52	98	45	2 25	276½	3.15
No. 3—Cheddar	207	20	0.19	86	10.5	65	101	40	90m.	264½	3.45
No. 4—Acid ..	193	35	0.19	85	10.20	70	99	30	80m.	257½	2.45

In commenting on the manufacture, readers will observe that the milk was renneted at a high temperature and very sweet, and a considerable delay occurred in coagulation and acid development. It would appear that the time of ripening and heating might have been extended; but the results of the test point to a favorable quality in the non-refrigerated samples.

Acid Determination.

The following give the percentages of acid taken at different stages in manufacture of the cheese.

	At Renneting.	At Cutting.	At Whey Running.	At Pressing.
No. 1	0.20	0.12	0.17	0.57
No. 2	0.18	0.12	0.21	0.37
No. 3	0.19	0.12	0.17	0.53
No. 4	0.19	0.13	0.22	0.38

Nos. 1 and 4 show the most acid, but the percentages are not considered high.

Hot Iron Tests.

	Running off	At Whey.	At Salting.
No. 1	1"	1"	1 1/2"
No. 2	1 1/2"	1 1/2"	1 1/2"
No. 3	1 1/2"	1 1/2"	1 1/2"
No. 4	1 1/2"	1 1/2"	1 1/2"

It will be observed that the iron tests correspond favorably with the acidity percentages.

Butter Fat Test.

	Per Cent. Fat in Milk.	Whey after Cooking.	Liquid from Press.
No. 1.....	4.00	0.24	0.50
No. 2.....	4.00	0.25	0.55
No. 3.....	4.05	0.25	0.70
No. 4.....	4.10	0.23	0.70

For further information on the subject I would refer readers to the *Journal* for September, 1898; May, 1899; December, 1899; and March, 1901. A perusal of the articles on cheese-making will be attended with benefit.

Shrinkage of Cheese.—On an average the loss for the first month was 5 per cent., in two months, 7 per cent., and in three months a total of 8 per cent.

Professor Drummond's Report.

In commenting on the refrigerated cheeses the professor states that each sample was dry and crumbly, and deterioration was evident in two of them. Of the duplicate four a favorable opinion is expressed.

No. 1. Cheddar, no Starter.—I consider this the finest sample of the lot. It has a creamy full flavor which is so much desired in a fine Cheddar; the color is decided and clear; the body and texture are very good. This class of cheese always meets with a ready sale at a satisfactory price.

No. 2. Acid or Loose Curd, no Starter.—This is a very good sample of cheese, and has such properties as are wanted in a fine Cheddar. The flavor is very good; texture and body good, with no indications of looseness, as found in several of the refrigerated samples; the color is bright and full. This class of cheese is always saleable at a good price on our English market.

No. 3. Cheddar, with Starter.—This is also a very useful sample of cheese. I would say it has been kept too long before being examined. The flavor is very good, possibly a little sharp, but at the same time clean; the body and texture close, with very good cutting properties; the color is not quite perfect, portions of it being slightly cloudy, which might be caused by long keeping. I consider this a useful and saleable cheese.

No. 4. Acid or Loose Curd, with Starter.—The quality of this sample is fair; the flavor I consider has been very good as a new cheese; at this date it is slightly strong; the color in portions of the cheese is gone, which I think has been caused by being rather acid made; the texture and body are very good, with the exception of being slightly rough to the feel; this would indicate too much acidity in the make.

In concluding his examination, Professor Drummond states as follows:—
 “In ripening milk with the prepared starter for Cheddar cheese-making, great care should be exercised as to when, and how to use it. At no time would I advise using more than from $\frac{1}{8}$ to $\frac{1}{4}$ of 1 per cent. of starter to the quantity of milk treated, and this would only apply to small quantities of milk well kept in a temperate climate. The development and control of lactic acid, or ripening, is the key note to successful cheese-making. Should the acid change be unduly hurried in the manufacture, the quality, as a rule, is disappointing, leaving roughness in texture and faulty undeveloped flavor. I have come to the conclusion, after a long experience, that it is a mistake to use starter in normal milk for cheese-making in a hot climate, and more particularly where large quantities of milk are being manufactured; and that more satisfactory results can be obtained by ripening well-kept milk with heat alone.”

Reference was also made to the severity of the test, and a request is made for further particulars of the experiments which Professor Drummond considers of much importance to the cheese-making world.

Dr. Tatlock's Examinations.

Dr. Tatlock, of Tatlock & Thomson, city analysts, Glasgow, conducted the chemical analyses, and the results show a most satisfactory standard of richness in each sample. The following is the complete analysis of the non-refrigerated lots:—

	No. 1.	No. 2.	No. 3.	No. 4.	Average Sample of British Cheddar.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Fat	43.95	39.81	39.50	40.74	30.10
Casein	24.70	28.00	28.95	29.19	34.20
Mineral matter	4.01	3.86	4.37	4.10	4.00
Water	27.34	28.33	25.18	25.97	31.70
	100.00	100.00	100.00	100.00	100.00

The refrigerated cheese show a similar analysis; one sample reaches a fat reading of fully 49 per cent. As the duplicate cheese, No. 4, is 40.74, in all probability the deterioration in the quality of the chilled product was accountable for the difference in richness, causing an uneven distribution of the fat.

Recommendations for Cheesemakers.

1. Have the milk in the purest condition.
2. Ripen by the application of heat, but use a starter from the purest source in cold winter weather.
3. Use the best coloring matter and rennet.
4. Employ the acidity apparatus and hot iron tests.
5. Coagulation should take place in from thirty to fifty minutes.
6. Cooking for one hour is a good average in the production of choice cheese.
7. Settling the curd in the whey for one hour is usually attended with good results.
8. Run off whey at $\frac{1}{4}$ " acid.
9. Milling and salting at 1" acid is a safe standard.
10. Hoop at a low temperature and press evenly.
11. Read the articles in journals named.

DANISH BUTTER-MAKING.

In a private communication received by Mr. G. S. Thomson from Professor Drummond, a short account is given of his trip to Denmark. The following interesting extracts are taken from the letter:—"I had a very pleasant trip in Denmark and Sweden, and I saw and learned a great deal while there. I consider the Danes and Swedes the best buttermakers in the world; they have a good scientific training and with this they are thoroughly practical and very clean and tidy about their work. I think their method of treating milk for butter-making is certainly the best, and particularly where the milk is cooled. They pasteurize both the milk and cream after separation, and, as a rule, the skim milk is returned to the farmer for feeding purposes. The law of the country is that all milk must be pasteurized before it leaves the creamery. The cream is ripened with a starter prepared from a culture; and I noticed that great attention was given to this part of the work. In many of the creameries I visited I saw from two to three different cultures being cultivated at one time, and unless the product was perfect in flavor it was not used. The cream is ripened at a low temperature—about 56° F.—and from 10 per cent. to 15 per cent. of starter used in the winter months, and churned in twenty-four hours, at a temperature of 52° to 54° F. I noticed that they ripened and churned their cream at a low temperature, and that the butter was very little washed. The butter, as a rule, is lifted from the churn with a wire sieve, and simply dipped in a large can or tank of cold water, and from that direct to the worker—during the working a little water is poured on the butter to remove the butter-milk—and then salted and allowed to stand six hours before reworking and packing. I should say that the cream would show 0.60 per cent. to 0.75 per cent. of acid when churned; of course less starter would be required in the summer months to get the condition of ripeness in the cream. I made inquiry as to what was considered the best color for butter for the London and Scotch markets, and in both cases the answer was 'a bright straw color'; in Liverpool and Manchester they like less color than London. The Danish butter is just a medium color, and it gives splendid satisfaction in all our markets, which is a very good guide to follow."

AGRICULTURAL EXPERIMENTS.

Last session a resolution was passed in the House of Assembly affirming the desirability of making experiments with cereals, manures, &c., under the auspices of the Department of Agriculture. The Minister of Agriculture obtained a report from the Inspector of Fertilisers as to the best experiments to undertake and the most suitable localities for carrying them out. In view of the present condition of the finances the Minister has decided that for the current season the work shall be confined to experiments with fertilisers and with rust-resistant wheats.

The Minister has approved of manure experiments being carried out at Quorn, Elliston, Purnong, Paskeville, Eudunda, Mallala, Naracoorte, Lipson, and Morphett Vale. The manures to be tested will be mineral super. (three different dressings), Thomas phosphate (two different dressings), guano super., bone super., bone super. and mineral super. mixed, concentrated super., and mineral super. and sulphate of ammonia mixed. There will be ten plots of two and a half acres to three acres each at all the places mentioned except Quorn, Elliston, and Purnong, and at these three the dressings with Thomas phosphate and super. and ammonia will be omitted, as the climatic and soil conditions are such that there is no prospect of any benefit being

derived from them. The experiments are confined to treatment which the farmers can carry out on a larger scale if the results warrant it. Heavy dressings are avoided, and manures that owing to high price, and those that have been proved unsuitable to our conditions, will not be tested.

The experiments with rust-resistant wheats will be carried out at Walloway, Petersburg, Port Germein, Pine Forest, Scales Bay, Balaklava, Arthurlton, Minlaton, Boothby, Murray Bridge, Aldinga, and Bordertown. At each place there will be about eight half-acre plots planted with different kinds of wheat. About twenty proved rust-resistant wheats have been selected, and these will be sent to districts where they are likely to do well, and as far as possible where they are not already grown. The farmers who have agreed to conduct the experiments have agreed to offer to the local branch of the Agricultural Bureau or to the Department of Agriculture half of the crop of each variety at 6d. above the local market price, the object being to afford the neighboring agriculturists an opportunity of securing seed of desirable wheats at a reasonable price. Every effort has been made to secure satisfactory results from the experiments. All the farmers undertaking the work are members of the Agricultural Bureau, and they have promised to observe conditions necessary to show the results that may be expected under good farming practices. With the manure tests the department supplies the manures free of cost, and with the wheats the seed and mineral super. is supplied. The Hon. Minister of Agriculture hopes that during next season it will be possible to undertake experiments in the manuring of vineyards, orchards, and pastures, as there is considerable scope for useful work in these directions.

FOREST PLANTING AND TIMBER SUPPLY.

By F. E. H. W. KRICHAUFF.

No. 5.—Preparation of the Soil. Sowing and Planting of Forest Trees. Pruning, Thinning, and Cutting.

The life of a tree depends on its roots. The larger of these are for fixing the tree; the smaller rootlets with hair-like ends conduct the nourishment through stem and branches to the leaves, and these rootlets must be cared for when the young tree is transplanted, neither destroyed while taken from the nursery, nor by long exposure. Dipping into a thin mud or puddling the roots when they are bare is of advantage, and finely-pulverised soil should be brought firmly into contact with them without undue pressure, after they have been carefully spread out. Small trees, one or two years' old, give in favorable localities in that respect far less trouble, and are perhaps quite as sure to grow. Where trees coming from a distance seem to have suffered from exposure and heat, it is advisable to loosen the bundle, dig a trench, pour water into it, throw the trees in, cover with loose soil and water again. After twenty-four hours roots and bark will probably have lost their somewhat shrivelled appearance. Very valuable trees might be protected by being enclosed in moss, which should be wetted frequently, and not removed before leaves make their appearance.

I may be wrong, but I believe forest trees are here generally planted too far apart; at least, those planted by the Forest Board, which had no chance of becoming fit for anything but firewood. The practice in Germany is to plant them about 20 in. to 2 ft. apart, and two together, if quite small, of which only the strongest is afterwards left. Such close planting is done to enable the trees to quickly close up, thus preventing the growth of weeds as early as possible, and through them, the danger of bush fires, and yet to obtain some shelter for the

soil. This would require 15,000 or 10,890 single trees respectively per acre, or if two are planted, double the number. If planted 8ft. apart, 680 or 1,360 would be required, and this distance is about the greatest that trees may be planted, even in low-lying well-sheltered situations.

The preparation of the soil demands some care, especially in our North, so that the roots can penetrate deep enough to escape the effect of the summer drought. Hurried work will lead to poor results; a tree may indeed grow, but not to advantage. Deeper cultivation than is usual for cereals, certainly not less than 6ins. even in favored localities, is imperative, and as early as possible. Air and light must be able to properly act, and to disintegrate the soil another ploughing and several harrowings may sometimes be very desirable. To plough only a strip for planting and leave the rest for another year to be turned over will never make as good work, especially where subsoiling seems necessary in strong clay or hard subsoil. By removing the mouldboard from your plough, let the ground by all means be stirred 15in. to 18in. deep to store up all the rain. It will be none too much for the success of your plantation. For very dirty land a skim-plough should be used some time before the ordinary ploughing, and perhaps subsoiling. Of course where soil and climate are very favorable, and stumps or stones are plentiful, you may even use a stump-jumping plough, and dispense with thorough deeper working by merely making the holes for the trees deeper than the ploughing. When planting only a small number of trees, which you can water, the holes should be not less than 2ft 6in. in diameter, and, instead of slanting inwards, the subsoil should be wider taken out than the surface, to prevent the growing of the roots towards the surface, and thus hinder cultivation. Bear always in mind that the dry soil surrounding the holes will absorb a large quantity of moisture, and for valuable trees the filling once or more with water before planting is advisable. An inch of sand, ashes, or chaff covering the surface of the holes may compensate for such absorption. Retentive soils are preferable to lighter soils in drier districts. Quicksand and the dunes near the sea must be treated differently. There cattle must not be admitted; any road ought to be formed, and either macadamised or covered with clay; rising ground should be levelled with the rest of such sandy land, and the whole covered with either brushwood or other material to prevent the wind from moving the land. Certain grasses like *Elymus arenarius* and *Psamma arenaria* may do this also effectually. When, sooner or later, the sand shows some settlement and vegetation on it, that is the time to plant trees, with some nicely prepared composted soil, without previously or afterwards working the soil. Subsequently, the young trees should be well looked after, and any shifting of sand, if possible, prevented. *Pinus maritima*, which has grown so well on the sandy shores of Gascony, in France, might here also be valuable. The seed was there sown, broadcasting 4lbs. per acre; but if sown in rows, and slightly covered with some loose dung, much less will be required.

The planting of gums where the soil contains much limestone is quite a mistake, as can be seen on the Adelaide park lands, where they die after some ten or twenty years, while gums are growing luxuriantly on the sandy parts. For other trees any limestone crust near the surface must of course be broken through to prevent either stagnation of water or, more frequently, to permit the rain to percolate, and, later on, the moisture to again, when needed, rise towards the surface. On land that is at times under water, or generally very wet, most trees, except willows, will best succeed on ridges made with the plough, or, where possible, drainage of some sort should precede planting.

Whether you plant small open-root trees in a hole made by a planting-stick or iron, or bigger trees by a spade, you should be certain that it be carefully filled with soil from the laid-aside surface, and the roots in touch with it. The subsoil, although loosened, has been kept in its position, and after filling in all

the surface soil a little above the level of the surrounding surface, press it down with hand or foot and put a little loose soil on top, sloping from the stem. It is best for two persons, a man and a boy or girl, to do the planting; one to open the hole and attend to the proper filling in, the other to hold the young tree and, if a larger tree, to shake it gently up and down while the loose soil is dropped on to the lower roots, to keep it an upright position and at the right depth. Plants in pots should only be planted with the ball of earth intact if the roots do not encircle it; if pot-bound these should be unwound, even if a considerable portion of the soil falls away. Then spread the roots well in the hole.

Plants raised in bamboos or other similar contrivances have often a great advantage in this climate, and more so if sent from a distance. They can be planted by one person with a trowel, provided the soil is in good order. Splitting the side of the bamboo at the time is advisable only when it seems very thick and not partly rotted. The top of the tube should be covered with about 1 in. of fine soil, making it slightly higher than the surrounding surface. As some members of country Bureaus have undertaken the task of raising trees from seed for their neighborhood, they may desire to be informed how to act with bamboos. Our so-called bamboo is *Arundo donax*, which grows freely with a little moisture. Two year old shoots will be best to cut, freed from leaves, and left for some time until dry enough to be easily cut into 5 in. lengths by a meat saw. They should be buried for months until required for sowing. The knots should be either not used, or opened with a stick. I advise to place the tubes into kerosene boxes opened on the broad side, fixing a handle from thick fencing wire so as to be handy for moving them to wherever they may be required. After being filled with some inches of a good loam these boxes should be sunk some 8 in. into the ground and the tubes then packed close together one by one on a level. Fine dry leaf-mould should now be sifted over the tubes and pressed down in them. After two or three seeds have been dropped into each tube, leaf-mould or dry rotted manure should be sifted over them to the depth of about a quarter of an inch, and the whole well watered with a fine rose of a watering pot. Every evening at least this must be repeated and shade of course given, except in rainy weather, unless the rain is so heavy as to expose or wash out the seeds. After germination only the strongest plant is left in a tube. While all gums and other fine seeds are doing well in bamboos I have had no success with larger seeds, such as carobs or pines. These should therefore be sown on nursery beds with a good average loamy soil somewhat improved by fertilisers, as I shall mention in another part of my articles on forestry. The bed should be trenched 2 ft. deep and protected by palings or bamboos, especially toward the north end, and of course well watered and shaded during the hottest hours of hot days. During the first week or ten days bags might be placed on the beds to better induce germination. If small seeds are to be sown in nursery beds I advise to press a three-cornered lath into the soft surface, or a board to which three such laths are fixed 4 in. apart. This prevents the seeds to fall otherwise than in a row apart from each other.

These fine seeds should be covered only sufficiently with fine soil, so as to be not more visible, and this gently pressed down in the rows. If moss can be had it is advisable to cover the whole of the nursery bed with it. This will not only prevent the soil from becoming too dry, but germination is likely to be quicker and more even. Soon after the young seedlings make their appearance, the moss should be removed from the rows, or the seedlings may grow into it and become too long. They must not remain longer than two years in the nursery bed, and, if not then wanted for a plantation, they should be transplanted into other beds at distances of 3 in. or 4 in. in rows 6 in. to 8 in. apart.

Moss or leaves between these rows is now of advantage. The seedlings will form many roots, and are much more likely, after a year or two in such beds, to grow when transplanted into the open. When taken up they may be tied into bundles, and the roots immersed into a thick clay puddle, which will protect them somewhat from getting dry during removal and planting.

A matter which is of considerable importance when making any plantation is to consider the direction of the hot and cold winds, both of which may greatly hinder success. If the trees are planted in rows, it is advisable to have the rows at right angles against these winds, and to plant the outside trees towards north and south very close together and irregular, to allow them all branches, and to use there hardy and quick-growing varieties of trees and even shrubs. If this is done two or more years before planting the timber trees themselves, better success can be expected, and perhaps no actual loss of time.

It is difficult to give directions how to prune and thin. If trees are planted close, they will prune themselves for some years, and only crooked and mutilated branches must be removed. Later, of course, thinning will be necessary, for of the 10,000 trees per acre only 200 will eventually remain as timber trees. In thus gradually thinning out, pruning of those remaining will become necessary as their position is becoming more open. Close planting was only adopted to force the tree to grow up straight, forming a fine cylindrical trunk without knots or flaws, and thus make the best timber. While the first thinnings are almost valueless, later ones are useful, and may perhaps have a greater money value than the cost of thinning. How to thin is more or less settled by any domineering tree within a certain radius, and which is gradually taking the light from others.

To adopt here the German system of a "normal forest," from which every year the same number of trees and of acres are cut as being ripe for harvest, is at present unlikely. Of course it is desirable to have every year the same volume of timber yielding a steady revenue; but the felling budget will here be determined, as in France, by the diameter of trees in any forest area, irrespective of any year's plantation. It would be better though to cut the whole plantation of any one year. You can then re-forest this area; the forest capital is re-invested after receiving the interest which had accrued for many years.

The time to plant trees into forests is after the first good rains in April or May unless hard frosts are expected in midwinter, and in such case August may be a safer month, especially for eucalypti. Pines and deciduous trees should, however, reap the full benefit of the winter rains, and are not so tender.

In my opinion every landholder should try to grow trees in such quantity as will supply him with at least the hardwood timber he may require for fencing and domestic requirements. Our farmers, however, are not doing much to raise timber trees, or even such as might supply them with firewood. When my Bill of 1872 passed, granting landowners of the value of £2 for every acre, not being less than five acres planted in accordance with regulations, and kept in a good preservation, a few larger plantations were made, notably by the late Ernst Bradtke, of Mannanario, and J. H. Angas, near Clare. Since the repeal of these provisions (provisions which the late J. E. Brown, F.L.S., praised as the first move to encourage the planting of trees), not many larger plantations have come under my notice. Mr. J. McLachlan, M.P., with eleven acres near Owen, is one of the exceptions; and yet there are times when a farmer, after he has settled a few years, can very well attend to the fencing and preparing of the land for trees, and to sow or plant them. The majority have also so much land that they can spare a piece from their crops or from grazing to await an ample return in after years.

Is not the present Government willing to have these provisions, somewhat altered as regards the bonus, re-enacted, and to give thus an impetus to the planting by private owners?

POTATOES FOR PLANTING.

Generally speaking it is doubtful whether the average grower pays so little attention to the selection of seed of any other crop as he does to the potato. The usual practice is to plant the small unmarketable potatoes, and when this practice is continued year after year what result can be expected? We have the planting of small potatoes, which are the product for several generations at least of a small tuber. The potato "seed" of course is not a seed, but rather a "bud" or "cutting." It is not so liable as a seed to deterioration from inbreeding, neither has it the opportunity that seeds have of getting new blood by crossfertilisation. While deterioration may not be so rapid as with seeds, it stands to reason that the small potatoes must in time tend to the production of an undue proportion of small tubers. There are several points in connection with "seed" potatoes that are worthy of discussion.

First, take this question of small potatoes. At the Ontario Agricultural Experiment Station this matter was tested for five years in succession. First year, large marketable, small marketable, and medium marketable were planted, and large, small, and medium seed selected from the respective plots. Thus they had large potatoes the produce of large potatoes, medium potatoes the produce of medium potatoes, and small potatoes the produce of small potatoes. Very small potatoes were selected as a fourth test, and this process was carried on each year. "Small" potatoes were those about $1\frac{1}{4}$ in. in diameter, and "very small" about $\frac{3}{4}$ in. The following is the result:—

Character of Seed.	Percentage of Marketable Potatoes.				Average Yield.	Average Yield, Less Seed.
	1895.	1896.	1897.	1898.		
Large	85.8	79.3	87.7	75.1	Bush. 201.1	Bush. 140.5
Medium	88.0	79.1	83.0	75.5	177.5	138.85
Small	89.3	79.9	81.0	74.8	131.8	114.1
Very Small	84.4	80.8	80.7	67.0	87.2	77.2

The result of the continued selection of small seed for four years is marked; the percentage of marketable potatoes and the total yield suffers. What must be the result if this is continued for a number of years? It must be remembered that in ordinary work the small seed is as likely, if not more so, to be the progeny of inferior yielding plants as of good yielders. An interesting experiment in this connection is within the reach of every grower. When digging the crop put aside the plants giving the best returns, also those giving poor returns, and select "seed" from each, either large or small, or both. Plant these side by side and keep up the selection for a year or two. In making use of large potatoes for "seed" there is no necessity to plant them whole, as in the experiment quoted. Under average conditions cut setts will give equally as good results as small whole setts.

Then there is the question of the size of the setts; this, rather than the number of eyes to the sett, although both have an influence, affect the returns. The tuber contains food stored by nature for the plant to utilise when the "eyes" start. It is only reasonable, therefore, that there should be some relation between the weight of the sett and the vigor of the resulting plant. Two ozs. setts with two eyes appear generally to give best results. In experiments carried out at Ontario with different weight setts, each with one eye, $\frac{1}{2}$ oz. setts in four years averaged 125.8 bush. per acre, 1 oz. setts 152.5 bush., and 2 ozs. setts 177.4 bush. The proportion of marketable potatoes does not,

however, seem to depend so much upon the size of the sett. It was also found that, to a certain extent, the number of eyes to the sett has an influence, although this is not so marked.

Another point is change of "seed." As with other plants an occasional change will prove beneficial. In many districts where it can be arranged, growers in the hills exchange seed, year after year, with growers on the neighboring plains, mainly, however, for convenience in getting "seed" ready for sowing at a certain time. While this is an advantage, it must not be forgotten that it is not after all "a change of seed." The produce is only one generation removed from the previous crop; what is required is altogether new seed.

Some people cut and plant the setts the same day; others will not bother if it is two or three days before they are planted. At Ontario the average of four years' experiments was 165·76bush. per acre from setts cut and planted the same day, and 154·48bush. from setts planted four days after being cut. Dusting the cut setts with gypsum is found to have a beneficial effect, the yield being considerably increased thereby.

ARSENICAL SPRAYS FOR CODLIN MOTH.

During the past month considerable attention has been directed to the satisfactory results obtained by Mr. G. Sandow, of Grunthal, from the use of arsenite of soda as a spray for the destruction of codlin moth caterpillars before they enter the apples or other fruits. So satisfied is Mr. Sandow of the efficacy of the treatment that he has publicly stated that he will guarantee to save 90 per cent. of the fruit in the dirtiest orchard. There has been considerable correspondence in the daily papers with references to "Mr. Sandow's specific," "wonderful discovery," &c., and some, who from their position ought to know better, write as though this was quite a new discovery in the treatment of codlin moth, while, as a matter of fact, the officers of the Agricultural Bureau have, for the past ten years, been persistent in their assertion that spraying with arsenical mixtures was the only rational method of dealing with the pest. Results of this treatment in other parts of the world have been given repeatedly, and there was no reason why this should not have been equally successful here. Their efforts to induce growers to take this work up have, on the whole, been ridiculed, and growers who do not want to be compelled to take effective action against the pest have sneered at the officers for their alleged want of knowledge and advocacy of theoretical ideas that could not be put into practice. This is, however, the usual experience of the advocates of improved methods; in this State we have it illustrated very forcibly in regard to spraying for suppression of various fungoid diseases, in the practice of early fallowing, the use of manures, &c., though not to the same extent as with the matter under notice. Now, however, there is a disposition on the part of many orchardists to think there is possibly something in spraying. While not in any way detracting from the credit due to Mr. Sandow for the publicity given to the success that he has secured, it is only fair to show what has been done by the department.

Besides recommending the use of Paris green, or other arsenical mixtures, authority was obtained to demonstrate the efficacy of this treatment, and, in 1897, Mr. George Quinn, Horticultural Instructor, carried out some experiments at Marion, in Mr. A. Quick's orchard, and secured very satisfactory results. From unsprayed trees nearly 60 per cent. of the fruit was infested, while those trees sprayed three, four, and five times with arsenical mixtures, including arsenite of soda, were remarkably free, from 4 per cent. to 10 per

cent. only of the fruit being infested. The growers of apples showed the sincerity of their oft-expressed desire for proof of the efficacy of the treatment recommended by abstaining from visiting the orchard, though full publicity was given to the fact that the experiments were being carried out, and have since excused themselves from testing it in their own orchards by stating that these experiments made proved that the cost was too heavy to be profitable. A few growers, however, who inspected the orchard were well satisfied with the results obtained, and expressed their intention to put the spray to practical test in their own orchards. Although some did so and have continued quietly to use arsenical sprays since, others let press of work interfere. This past season, however, several large growers have given the spray a thorough trial and are well satisfied that it is the only effective way to combat the pest. Most of them have not made the results public, and while this is to be deplored it cannot be wondered at, when the reception given by so many of the growers to the official tests and recommendations is remembered.

The spray that is cheapest and most effective is the arsenite of soda, originated by Professor Kedzie, of America, and known as Kedzie's formula. This is made by boiling 1lb. white arsenic and 2lbs. washing soda in 1gall. of water until thoroughly dissolved. One pint of this solution is added to 40galls. of lime water, made by slaking 4lbs. fresh lime in the water. This was the mixture that gave the most satisfactory results at Marion, and it has been repeatedly published since that time for the information of growers. The cost of the work will depend largely upon the size and condition of the trees, the facilities for working, the varieties of trees, &c. Considerable judgment must be exercised by the grower as to when and how often he should spray his trees. Mr. Sandow sprayed the early maturing fruits twice, the medium three times, and the late fruits four times, and states that the cost of materials does not average more than 5s. per 100 trees. There is little doubt, if the department protects those who produce clean fruit against the unfair competition of infested fruit, that next season a very considerable number of orchardists will make vigorous efforts to combat the pest.

The sincerity of the statements of some of those who most severely criticise the actions of the department is strikingly illustrated by the fact that, although the fullest possible publicity has been given to the results of the Marion experiments, both in the official *Journal* and in pamphlet form as well as by the daily and weekly press, these men prefer to ignore these results, and to quote from Mr. Quinn's report of some previous experiments with Paris green which was afterwards found to be devoid of arsenic and absolutely valueless as an insecticide.

RENMARK NOTES.

The river at Renmark is very low; all traffic suspended. Teams are now at work carting stores, &c., from Morgan.

The raisin crop is nearly finished; another two weeks will see all the fruit in. The total amount sent to the Packing Union is estimated at 170 tons.

Mr. Harrison, of Renmark, had a wonderful crop of Zante currants; fifty vines, occupying less than a quarter of an acre, yielded 11cwt. of dried fruit. This is the result of many years of experiments by Mr. Harrison on this class of vine.

On Lord Dereamore's estate sixty-five acres of Gordo Blanco vines have again this year yielded well, but not quite as good as last year. This year's crop is estimated at 100 tons of dried raisins; last year 107 tons. The fruit is dried, stemmed, graded, and packed on the estate,

NOTES ON VEGETABLE-GROWING FOR APRIL.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

The recent rains will gladden the hearts of the growers of early vegetables on the plains. Newly planted cabbage and cauliflower plants must benefit largely by the oportune downpour. If followed by other showers, the aphid and green caterpillar which are usually so troublesome to these kinds at this period will be held in check. On the whole, the month will be a busy one for vegetable planters in all but the cool hilly districts. All kinds of cabbage, cauliflower, onion, kohlrabi, lettuce, celery, Brussels sprouts will be planted out. Prickly spinach, radish, parsnip, carrot, onion, cress, turnip, and broad beans will be sown in the open garden.

It is too late to sow peas for early gathering, as these if put in now do not set pods in the cold weather.

All growing crops of carrot, parsnip, turnip, onion, &c., require judicious thinning before the plants become drawn and weakly. One usually considers how much space is required to permit each root to expand to a normal size, but the necessary space to allow a proper development of the top is of equal, if not greater, importance in the production of root crops.

The soil between all growing crops should be stirred from time to time with hoe or fork, to maintain it in sweet condition. Most growing crops are benefited by a slight top-dressing of superphosphate sprinkled along the rows or around individual plants and hoed or washed into the soil.

In prepared beds sowings for successional plantings should be made of members of the cabbage family, onions, and leeks.

In making sowings of vegetables which are desired to make the best progress during winter a choice of situation and soil is of importance. A soil with a warm limestone bottom, or a hillside facing anywhere from east around to north-west offer good opportunities for quick growth now. Shady positions should be avoided, and drills made to point north and south usually allow a more even distribution of sunlight upon the plants.

The harvesting of summer vegetables will soon be brought to a close. Late tomatoes require exposure to the sun to ripen them, and should be treated accordingly. Good cucumbers should be saved for seed. This may be done by putting them away in a dry secure place where they will dry up into shells as the winter goes on. Melons, pumpkins, and trombones should be housed before too much rain spoils their keeping qualities. Growers of dwarf and runner beans should save all their ripened seeds, as there is a growing demand for dry beans as an article of food in the country districts north of Adelaide.

The topdressing of rhubarb and asparagus beds with farmyard manure should be carried out wherever time permits. The dead leaves of the former should be first cleared away to the compost heap, and the seedbearing yellow stems of the asparagus cut off and burnt.

The early rains will bring out legions of slugs and snails. The former are best killed by dusting fresh lime over the beds of plants every night for a fortnight, and the latter by hand gathering after showers.

HONEY TOFFEE.—The following is a tested recipe for honey toffee:—Boil together 1lb. honey, 4ozs. butter, four tablespoonful of vinegar, and one of water, and continue the boiling until the mixture thickens. Butterscotch toffee: Take 1lb. honey and $\frac{1}{2}$ pt. water; set over a slow fire, and when cooked enough add $1\frac{1}{2}$ tablespoonful of butter, and lemon juice to taste.

ORCHARD NOTES FOR APRIL.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

The last days of March have witnessed an agreeable change from the droughty conditions hitherto prevailing. The protracted period of dry weather had begun to tell seriously upon many fruit-producing plants where no facilities were available for the artificial application of water. Strawberry plants have suffered severely, and prospects were becoming more gloomy every day. With the fine soaking showers lately experienced over the fruit-growing areas the chances for these plants have improved vastly. It is truly wonderful how they recover vitality, and rows of apparently dead leaves will now soon turn into green strips of strawberry foliage. There will probably be a dearth of good runners to fill up the many gaps made by those plants for whose resuscitation the rain arrived too late.

Owing to the violence of the wind experienced in January the western side of nearly every fruit tree became prematurely defoliated. In most cases no new leaves were grown, and the twigs and shoots now present a somewhat forlorn appearance. It will be interesting to note as the season proceeds what effect this will have upon the development of the buds.

Unless the recent showers are followed by more rain citrus trees will still require attention in the direction of watering. Although of great value to shallow-rooted plants the moisture has not penetrated sufficiently deep to supply all the needs of trees. The citrus trees, moreover, are now carrying a growing crop which exercises a constantly increasing drain upon the trees. Any serious lack of moisture at this stage must prove fatal to the attainment of high quality in the fruits, to say nothing of the impoverishment of the tree. Where good attention has been given throughout the year the citrus trees will now be making strong growths. These should be regulated whilst yet sappy. Where they arise in dense masses thinning out, by entirely removing some shoots, should be resorted to. Those retained will then secure more growing space, and be individually stronger. Dead wood should also be removed. This is also a good time to remove mature but unnecessary branches, and thin out the tree generally, providing always that too great a sacrifice of the fruit is not entailed.

Young citrus trees may be set out early in the month, with every hope of successful establishment. On the whole, however, early spring is most favored here for this work.

In those citrus plantations where red scale is troublesome an effort should be made to reduce the pest during this month. The writer has had much success in destroying these insects by the use of resin spray during April. The formula found of most value consisted of 10lbs. resin, 10lbs. washing soda, 5lbs. common soap in 50galls. of water. These were boiled and dissolved in the usual manner. Many persons find a difficulty in making resin wash. The common errors consist in not using a vessel sufficiently large in which to boil the ingredients; a second, in putting the powdered resin into the boiler too rapidly. It should be added gradually, and dissolved piecemeal. Boiling over is a great trouble. A friend from Renmark recently showed how this may be simply overcome by standing a small bucket or tube full of water in the centre of the boiler during the progress of the dissolving process.

In those orchards where all crops are harvested the present season offers a good opportunity of adding humus to the soil by sowing field peas. In some orchards in Victoria this is resorted to with marked success. The peas are sown upon the surface in company with a good dressing of bonedust or superphosphate immediately after the first rains. These are then ploughed into the soil. The rough surface of the ploughed ground then assists the winter's rain

to percolate deeply while the peas are growing. In spring while the ground still contains much moisture the pea plants are turned under by a second ploughing.

Intending planters should lose no time in placing their orders with nursery-men, as the first comer has the choice of the stocks. This is an advantage that should not be despised. In choosing trees take medium sized, healthy, clean-barked, yearling specimens. Do not be drawn into purchasing skyscrapers or be put off with hard-barked stunted veterans which have been kept over from former years.

No time should be lost in completing the preparation of the ground to be planted this season. In most localities in South Australia May is the best month in which to set out deciduous trees. If replanted while the soil is warm young roots are made and the tree recovers to a certain extent before going to rest in the winter, although no new leafage is developed.

Those who intend raising young trees for future planting should secure the stones or pips from time to time as the different fruits ripen. These should be stored away in dry sand in a cool place until the time arrives for planting them. The germinating power of a large percentage of the seeds of nearly all our common fruit trees is destroyed if they are kept in a dry position exposed to the air. With the exception of the members of the citrus family these seeds are sown in winter, from May until July.

The loosening or removal of bands applied when buds were inserted now demands attention. If this is neglected the "buds" may be ruined by strangulation owing to the enlargement of the limbs due to the ripening of the newly-formed sap layers.

The rains, so valuable in other respects, are almost bound to injure the late grapes, such as the thickly-clustered Doradillo and Wortley Hall varieties. The opening of the vines to the ready-drying effects of sun and wind should prove useful in warding off the rapid development of rot-producing fungi.

The season in the coastal districts has not been favorable to outdoor fruit drying, and dryers have been put to considerable trouble where evaporators have not been available to finish off the product.

The codlin moth trouble is much to the fore at present. This trouble, like many others, promises to show a silver lining to the clouded prospects when they seemed very gloomy indeed. In desperation some of our fruitgrowers appear to have tried the spraying remedy so long and highly valued in America, and more latterly in England. They have also entered into the matter with a thoroughness which heretofore appeared to be lacking. The results are now giving renewed confidence in the fight against what to fruitgrowers should be the common foe. Although one may fully believe that good results will continue to be obtained from its further use, other well-known precautions should not be neglected. Caterpillars destroyed in the plucked fruits, caught in bandages, killed by scraping the stems, or prevented from escaping into rubbish in the orchard, and moths caught and killed in the fruithouses, should not be overlooked. Every garden owner will not spray, and unless these other precautions are carefully followed flocks of moths must emerge throughout the summer to infect the fruits of those who do. That the spray will protect every inch of exposed fruit surface throughout the summer no one can maintain, still one is justified in assuming that in the coming season this method will receive a wider and more thorough recognition than heretofore.

SEALING WAX FOR BOTTLES.—An excellent black sealing wax can be made by melting together 6½ lbs. of black resin, 8 ozs. beeswax, and 1½ lbs. powdered ivory black. For red wax, substitute venetian red for the ivory black; or other pigments may be used to produce other colors in the wax.

POULTRY NOTES.

BY D. F. LAURIE.

NOTE.—Letters of inquiry, &c., should be addressed to me, c/o Engineer-in-Chief's Office, Adelaide, enclosing stamped envelope if reply required.

Improving Farm Poultry.

Every poultry owner, especially those who own only mongrels, should endeavor this season to breed a more profitable class of bird. Again I would remind readers that it costs no more, in an ordinary way, to keep a good bird than a bad one. There is this to be said of the good bird, that for the amount of food it consumes it gives a far greater return.

In the case of the table-bird breeds and their crosses, a bird fit for market can be produced in less than three-fourths the time it takes a mongrel to become fit for even an easily-satisfied purchaser, while the quality and condition, as well as appearance of the good bird are far better than any ordinary scrubby mongrel. There is always a constant and profitable demand for birds of this description, while for inferior sorts only the lowest prices can be expected.

As regards the laying breeds, as a rule they are very small eaters, and a good strain can soon be bred which will produce double or treble the number of eggs laid by the ordinary barndoor.

I have received numerous communications from the country in which the writers say that they are convinced that poultry are highly profitable. From some I gather that poultry-keeping is their mainstay, owing to the dry seasons rendering wheat-growing and sheep and cattle grazing unprofitable. While I deeply deplore this state of drought, it is possible that it is not an unmixed evil, and that out of it good may come. It will teach us the value of "unconsidered trifles," and the necessity for giving attention to those of the so-called minor industries which are suitable alike to climatic conditions and profitable demand. Others again write for pens of birds from which to breed a flock of profitable stock. It is very gratifying, after many years of work, to find the appreciation of poultry so widespread, and I again invite all members of Bureau Branches and their friends to write to me for advice, and it will be a pleasure to attend to their requests.

Where birds come from a distance the following rules should be strictly observed:—

1. Place in a warm well-ventilated coop and keep for, say, a week, till the bird has settled down and seems quite well.
2. Give water sparingly, and even then it should have been boiled and allowed to get cold. A change of water is often provocative of disease.
3. For a few days feed on bread well soaked in boiled milk. If milk is scarce make a sop of stale bread and boiling water; then squeeze out the surplus water and add a little hot boiled milk. Then gradually feed ordinary food.

Eggs for hatching which have travelled should always be placed on their large ends in bran or chaff, and allowed to rest for twenty-four or thirty hours before placing under a hen. When valuable eggs are in question use two hens, and place half under each. Never overcrowd a broody hen with eggs; give her a rather less number than she can cover. Make all nests on the ground and keep clear of vermin.

Poultry Diseases.—No. 5.

DEBILITY.

It might cause remark, unless due explanation were given, why I refer to ailments that should not occur in sound well bred poultry. It must be remembered that unforeseen causes often upset all calculations. Debility is often the result of a sudden change, such as a bird bred in the south experiences when sent north; it is also the after effect of over-showing, especially in the case of an untrained nervous bird. If not attended to the birds often "go light," as the term is, and waste away till death drives the remaining spark of life out of a miserably attenuated frame. Owing to the lack of knowledge and care in breeding many strains are prone to feel the effects of such sudden changes of life. Indeed, over-stimulated young birds, especially those bred from forced parents, suffer in this way. Provided the bird has good quarters and a sufficiency of good food, green feed, water, grit, &c., there is but one course to pursue, and that is to tone up the system. Professor Woodruffe Hill gives the following prescription:—"Tincture of perchloride of iron, 2drms.; compound tincture of gentian, 2drms.; lime water, 2ozs.; eggs, 2; cod liver oil, 4ozs." Shake thoroughly into an emulsion and give two teaspoonfuls three times a day. Many people give an egg twice a day, and half a teaspoonful of Parrish's chemical food in half a pint of drinking water. Towards recovery a little minced meat may be given, or better still, if obtainable, worms and grubs.

DIARRHŒA.

This malady is very common, more so at certain times of the year. Improper food and impure, dirty, and sunheated water all cause these bad results. The general symptoms are the frequent evacuations of loose liquid matter, usually watery and frothy. Various remedies have been given, and are as follows:—

1. A teaspoonful of castor oil, followed by 5grs. of rhubarb and 10grs. of carbonate of soda, or a grain of opium.
2. Chlorodyne or painkiller, three to six drops in a dessertspoonful of water twice a day.
3. In severe cases a pill containing a grain each of tannic acid and opium.
4. Stale penny sponge cakes soaked in neat brandy. This has proved very effective.
5. Teaspoonful of castor or (for young birds) salad oil, followed in an hour by 2ozs. of the following mixture:—Whip the whites of two eggs to a froth, and add to this an equal quantity of milk which has been slowly boiled for about an hour. This is an effective remedy, and never fails for diarrhœa, dysentery, or cholera. Give this mixture (not the oil) every six hours. No food is required till cured, which is very soon.

DIPHTHERIA.

This dreaded disease is also termed diphtheritic roup, being met with very often in conjunction with certain forms of those diseases known under the general term "roup." This terrible disease, so fraught with dreadful consequences to infant life, is unfortunately very prevalent amongst poultry, pigeons, and domestic cats. There is not the slightest doubt that diphtheria can be transmitted from human beings to other animals, and *vice versa*. Canker, a common and very prevalent trouble among pigeons, is undoubtedly diphtheria. Pigeons frequently camp on house tops, and not only is the rainwater contaminated by their droppings in the ordinary way, but in addition diphtheria germs are scattered far and wide. Some constitutions may escape typhoid, but few can withstand diphtheria microbes.

Symptoms and Treatment.—Canker is the simple form, and makes itself known by the presence of small cheesy deposits in the mouth, on the tongue, and round the opening of the windpipe; sometimes the cheesy mass is at the corners of the mouth. In this stage it is as well to give a dose of oil, salad for preference. All affected birds should of course be isolated and put in coops as far away from human habitations as possible. Carefully remove, with a piece of deal or other soft wood, each speck of the cheesy matter; avoid drawing blood. Then apply a pinch of boracic acid, or powdered borax, or burnt alum; if not available try flour of sulphur. As a rule this stage readily yields to this treatment. In a worse stage of diphtheria we find the characteristic spots on a purple or leaden-colored throat. The mouth is full of sticky matter and there is an offensive smell. Ultimately the true diphtheritic or false membrane forms, completely closing the glottis and larynx, suffocation and death at once ensuing. In handling such birds use plenty of disinfectants, and wash the hands afterwards in a solution of carbolic acid, one teaspoonful acid to a pint of hot water. For several cases treat with boracic acid; a teaspoonful to half a pint of hot water will be found excellent for swabbing out the mouth. Apply a pinch to each sore; also to the ulcers which will be found in the mouth, especially under the tongue. Chlorinated soda liquor, 1 in 10, has often been prescribed, and I know it has succeeded in numerous cases. The shreds and specks may be treated, also the ulcers, by painting with either tannic acid (5grs.) and glycerine (1oz.), or tincture perchloride of iron (10 minims), and glycerine (1oz.), or a solution of nitrate of silver, 10grs. to the ounce of water. During convalescence give a pinch of Epsom salts in the soft food to act as a tonic. Steaming in medicated vapor is also good. To do this effectually make a box about 3ft. high by 20in. square for a single bird. Half-way, more or less, place a grid of wire bars or stout wire-netting for the patient to stand upon. No top or bottom is required, as the box stands on the ground and the top is, during the operation, covered with a piece of sacking easily removable. Procure a kerosene or spirit lamp and a flat tin dish on a wire stand, and put a couple of tablespoonsfuls in the dish of equal parts of eucalyptus oil or No. 2 carbolic acid and water. The steam will rise and be inhaled by the bird. Have a piece of glass let in the side so that the bird can be observed, and if it appears groggy and overpowered by the fumes the cover must be removed for a time. Failing lamp and kettle, heat an old shovel or piece of iron to red heat, put into the bottom portion, pour on (a few drops at a time) a teaspoonful of acid or eucalyptus, keeping the opening closed as much as possible so that the fumes may rise for the bird to inhale. With common birds, where an outbreak has occurred I counsel the free use of the axe and subsequent cremation, or burial deeply, covering with quicklime.

DROPSY.

DROPSY OF THE CROP.—[See Crop, dropsy of.]

ABDOMINAL DROPSY is difficult for any but a skilled person to diagnose, and arises from structural diseases of the liver, tumours (especially scrofulous), and enlarged glands. A bird so suffering is useless, and should be destroyed.

DROPSY OF THE HEART BAG (*hydrops pericardis*) is seldom diagnosed and never cured. The general symptoms are restlessness, moping, head continually thrown backwards, inability to feed from the ground, and when attempted, reeling and staggering backwards, tumultuous action of heart, and occasional spasms. Death soon occurs when these symptoms become marked; in any case the bird should receive its quietus.

DROPSY OF THE WATTLES occurs occasionally in heavy wattled birds, and is due to serous effusion, often to such an extent as to appear like two bags, much to the discomfort of the bird. Bruises or blows may cause this condition, which may also be consequent on plethora. With a clean keen-bladed

pocket-knife or lance dipped in boiling water or strong antiseptic cut open the lowest part of the wattle and express the fluid; then syringe out with warm water, to which add a few drops of perchloride of iron, which will arrest bleeding in addition. Do not overfeed your birds, as dropsy of wattles is often nature's safety-valve.

ECZEMA.

Judging by descriptions forwarded to me, this ailment is not uncommon, and may often be confounded with chicken pox, commonly described as warts. Eczema is said to be non-contagious; but that is an error. It is not highly so, but it is known to extend to the feet from the bird scratching the wattles, the chief seat of the disease. It is chiefly due to an overheated state caused by too stimulating food, and is often seen on birds which are being forced on unduly.

Symptoms.—An eruption of minute vesicles, which generally conglomerate, and, on bursting, the contents forms scabs or crusts. Depression, dullness, and impaired appetite are accompanying symptoms.

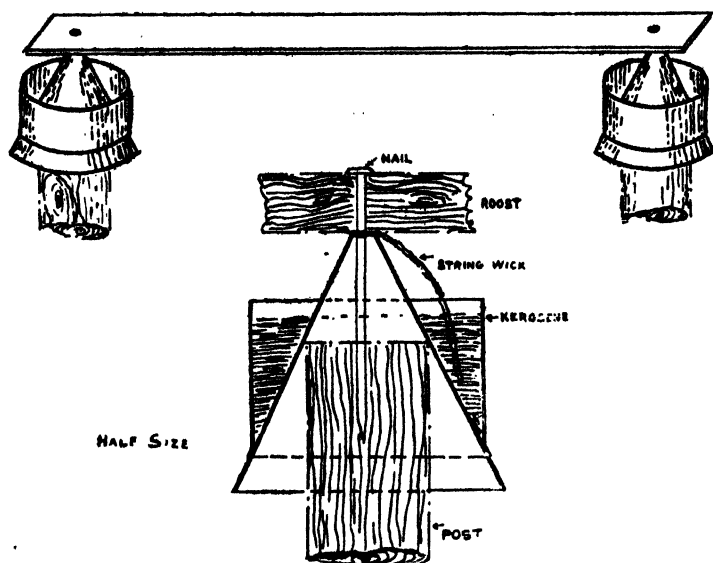
Treatment.—Ten to 20grs. of sulphate of magnesia and a grain of calomel, followed by 3grs. of carbonate of iron twice a day in a teaspoonful of water. Another cure is 2grs. of calomel each alternate night and a pill twice a day for a fortnight of $\frac{1}{2}$ gr. each of citrate of iron and quinine. For local application use benzoated oxide of zinc ointment three times a day; or in severe and neglected cases where the crusts are hard, first soften with warm water, and then apply with a feather or brush three times a day oxide of zinc and olive oil, of each $\frac{1}{2}$ oz.; tincture of arnica, 2drms.; spirits of camphor, 1drm.; pure (No. 1) carbolic acid, 10 minims; rose water, 7ozs. Give plain food, with plenty of fresh green food; or a little Epsom salts in soft food, a pinch only.

GREEN FEED FOR POULTRY.

A plentiful supply of green feed is one of the main essentials to success with poultry. In many cases the natural herbage affords all that is required from May to September, when the fowls have plenty of run. During the summer and autumn months, however, green feed is usually conspicuous by its absence. In and around the cities the waste from the green vegetables purchased from the hawker may suffice for a few fowls; where there are larger numbers green feed is cheaply purchased, but to poultry keepers in the drier districts the question is not so easily solved. In most cases, however, something can be done to supply this necessity. When the ground can be soaked occasionally, a little plot of lucern on which the fowls can run will perhaps be the least trouble. Where there is less water available, plants, such as rape, kale, cabbage, mangolds should be grown. If a small area of ground is broken up deeply, well manured, and worked down fine, considerable quantities of green stuff can be produced. If a little water is available it is astonishing what a small plot will produce during the summer. A few dozen plants of tree kale would keep a number of fowls supplied. Mangolds would supply both green leaves and the roots, the latter of which could be stored for some months. On sandy land piemelon can be grown; the fruits if chopped up will be greedily eaten by fowls. In early summer the waste leaves from cabbages, cauliflowers, &c., grown for the house, could be availed of. In many districts the native herbage, such as the more succulent saltbushes and shrubs, could be relied upon to furnish food in summer if a little protection and encouragement is given them. It is recognised by all authorities that green feed is absolutely necessary to health as well as to profit, and each poultry keeper should consider for himself how he can obtain this at least trouble and expense,

TICK-PROOF PERCHES.

As poultry tick is plentiful in most of our farming districts the matter of making the perches proof against tick is one of considerable importance. There is no doubt the most effective way is to build the poultry house of galvanized iron, fastened on the inside of the posts and rails, or, where only a few fowls are kept, to set 8ft. or 9ft. iron about 6in. or 9in. in the ground, and draw them together at the top with a piece of ridgecapping, and swing the perches by wires from the roof. Many farmers and others do not feel disposed to go to this expense, and various devices are resorted to to keep the ticks from gaining access to the perches. One of the simplest and most effective of these has been sent to the editor by Mr. F. H. Pybus, of Port



Augusta. The drawing explains itself. The trap is very simply made by anyone who can use a soldering iron. Mr. Pybus fills the tin with kerosine, taking care that the string from the nail head is in the kerosine. He finds dead ticks occasionally in the traps, probably taken up by the fowls. The perches can be fixed to anything convenient, and so long as the receptacle is replenished with kerosine once a week no ticks can climb on to the perches. The trap can, of course, be made any size that is convenient.

The top figure shows the perch and tick-trap secured to two posts. The lower figure is a section through the perch, &c., showing details of construction.

INFLAMMATION OF KIDNEYS IN HORSES.—Open the bowels by giving 1pt. or 2pts. of linseed oil two or three times, at intervals. Apply fresh sheepskin, skin-side in, to loins. Give two scruples white hellebore twice daily and abundance of linseed tea. If in much pain add 1oz. tincture of opium to the purgative,

OATEN HAY FOR SOUTH AFRICA.

The Minister of Agriculture has received through the Agent-General the following conditions of contract for supply of oaten hay to the War Office:—

1. The hay to be in bales of 100 lbs., 10 per cent. more or less, bound with strong wire. Extreme care must be taken in selecting the hay and in pressing it in bales of the stipulated weight. The War Department will not be responsible for any loss due to "inherent vice" which is avoidable at the port of shipment.

2. It must be clearly understood that the hay is to be pure oaten hay, in the general and natural acceptation of the word oaten, as against any local interpretation. Nevertheless, any accidental mixture of wheaten hay, not exceeding 5 per cent., may be admitted under the contract. Should the certificate of inspection show that more than 5 per cent. of wheaten hay is mixed with the oaten, the delivery will be liable to rejection after discharge, and any portion accepted will be subject to a reduction in price, to be fixed by the Director of Army Contracts.

3. The hay to be inspected in regard to quality, condition, and weight, by the Government of _____ on behalf of the Secretary of State for War, such inspection to be final. The contractor shall, however, be responsible for any damage to the hay caused by contact with the bottom or sides of the steamer, or by insufficient ventilation.

4. The steamer to carry no deck cargo of any kind. Name of steamer, port of loading, and date of shipment to be reported by the contractor to the Director of Army Contracts at earliest possible date. Any alteration to be reported immediately.

5. The steamer to call at Durban for orders (to be given within twenty-four hours of arrival), and may be required to discharge at any two of the following ports, viz.:—Durban, East London, Port Elizabeth, Cape Town, or Delagoa Bay.

6. If discharging at East London, the steamer should be able to cross the bar. If not able, any lighterage incurred to be paid by contractor.

7. The hay to be unloaded at the average rate of not less than 200 tons weight per day, Sundays and holidays excepted. Demurrage, if incurred, to be paid by Government at the rate of 6d. per net register ton per day. Demurrage for half a day only will be paid where the detention does not exceed twelve hours.

8. On arrival of each steamer at Durban, an advance of 80 per cent. will be made, in London, on the value of the cargo (less freight) on production of insurance policies and bill of lading. Insurance to be effected with approved underwriters and/or companies. If freight and freight contingencies are insured, the advance will be 80 per cent. of the invoiced value. The balance due will be paid, in London, within fourteen days of receipt of a cable from the General Officer Commanding, Cape Town, notifying discharge. In regard to any payment made to contractor in respect of freight or demurrage, he shall indemnify the War Department against any claim of the shipowner for the amount so paid.

9. The Secretary of State for War has the option of cancelling this contract if the vessel has not arrived at _____ on or before _____.

FARM HINTS FOR APRIL.

BY THE EDITOR.

In the early districts the greater portion of the cereal crops should be sown. The late-maturing varieties should be put in first, and the early ripening sorts last. Rust-resisting wheat should find considerable favor, especially since varieties have been produced which are prolific, strong in the straw, holding the grain well, and of excellent milling quality. The land should be levelled to allow of better work with the seed drill and to facilitate reaping with a binder. Superphosphate at the rate of 150 lbs. to 200 lbs. per acre will in most cases pay for itself many times over in an increased yield of grain, and leave a residual value for next year. In the Middle and Lower North and Southern districts the whole of the cereal crops ought to be got in before the end of May, and not much later in the South-East. In all cases, every effort should be used to clean the land from weeds before sowing, and during the growth of the crops the charlock, or wild mustard, plants should be pulled up before they produce seed.

All seed wheat should be pickled before sowing, even if apparently quite free from bunt and smut. Half a pound of bluestone dissolved in a sufficient quantity of water is good enough to pickle 4bush. of apparently clean seed; but if signs of bunt are present use 1lb. of bluestone. Let the grain be pickled forty-eight hours before sowing, and make sure that the bags and the drills or sowing machines are free from spores of bunt and smut.

All seed wheat or other cereal should be run through the winnower two or three times to clean out seeds of weeds. Every weed in a crop helps to decrease the yield.

It is not too late, even now, to sow an acre or two of the stubble land with white mustard, to serve as an early green bite for the stock. Essex dwarf rape is also a good item to sow. Three pounds of seed of rape, or 1½lbs. of rape and 3lbs. of mustard mixed would do. On stubbles that have been cut for hay or cut with a binder, it would be sufficient to scarify the seed in.

Where night frosts are not early in occurrence this is the best month to sow lucern. The land should be worked deeply and made as fine and level as is possible. Drill in seed half an inch deep, rows about a foot apart; and use 10lbs. or 12lbs. of seed per acre. If sown broadcast use about 16lbs. Roll directly after sowing, and lightly harrow when the plants are 4in. high.

All fodder given to stock should be placed in racks, mangers, or similar contrivances, to prevent them defiling and wasting it. Any animal that interferes with the rest should be fed by itself, or rails or panels should be put up to keep them apart. If possible put a roof over the feeding places.

When the nights are cold the cows suffer and their milk supply is diminished. Make rugs from old sacks or woolbales with straps and buckles. Put these on every night, and take them off in the morning when the air is warmer than at night. This is rather a trouble, but well repays the attention.

Mixtures of grass seeds should be sown in the cooler localities now. The mixture should include cocksfoot, poas, clovers, trefoils, and some of the herbs—such as plantain, sainfoin, goats' rue, burnet, &c., to make a healthy and tasteful variety. Any bare places on paddocks should be broken up, manured, and sown with a few of the seeds mentioned. Stones, wood, bushes, &c., should be removed or heaped up. Cow cakes should be broken and scattered.

Manure, deeply plough, and pulverise places where forest trees are to be planted later on. It is useless to plant trees in holes; the whole soil must be broken up. A fringe of timber trees around a large paddock will shelter stock and crops, beautify the landscape, and prove to be a valuable asset in time.

Any farmyard manure in stock should be at once carted out and spread, so as to avoid carriage on soft land after the rains have started. Of course, the sooner the stuff is ploughed under the better. It is worth while to heavily manure a few acres near the homestead, to provide grass for the poultry and the cows.

With the ordinary implements used in farming a vegetable garden can be kept cultivated. A Planet cultivator, drawn by one horse, will do more work in ten minutes than a man with hoe and rake could do within an hour. Plough first deeply, then pulverise well with the scarifier, sow or plant in rows or drills, and cultivate between at least once a week. Use plenty of manure and abundance of vegetables can be provided for the greater part of the year. Any excess or waste can be fed to pigs and other animals. Cabbages, cauliflowers, and onions should be raised in nursery beds, and be planted out when large enough. Kales, cabbages, &c., should be planted from now onwards. Potatoes should be put in at once, in rows 3ft. apart, 1ft. between the setts, and 4ins. deep. Cultivate between and do not hill them up.

Prepare land for swedes and kohlrabi, which can be used for the table as well as for feeding stock.

The working horses should be well fed now, to prepare them for the hard work of seeding and breaking up fallow. Corn or pulse of any kind is strengthening.

Sheds and shelters for stock and all implements will well repay the cost and labor in erecting them by the saving in food and improved health and strength of the animals, as well as the lengthening the period of usefulness of the implements. A little paint and oil on the latter will save their cost in the amount of the blacksmith's and carpenter's accounts for repairs.

Keep the pigs well fed and growing. Those intended for slaughter should be fed on grain, pulse, and milk. Give no slops or green food.

Whilst admitting that rather too much has been claimed for ensilage, yet there are very few owners of dairy cows who do not value it highly. It keeps all herbivorous animals in good health; it maintains the flow of milk during the autumn and early winter, when there is nothing but old grass and but very little of that. It ensures a steady supply of succulent food; it digests more rapidly and completely than dry chaff or grass; it is proof against fire when once in the pit. The greater the variety of nutritious plants contained in the silage the better it is liked and the more wholesome it is. A pit once made properly will outlast several generations. Now is the time to sow a few acres with a mixture of wheat, oats, barley, vetches, peas, and any other plants that will do for ensilage.

In Algeria and elsewhere very large areas are cultivated with Sulla (*Hedysarum coronarium*), which serves the purpose of lucern. It is closely allied to sainfoin or esparcette, and will grow luxuriantly on sandy soils. It has done well in many places in South Australia, and it is very strange that it has not become as common here as it is in Algeria. During the summer it runs to a height of 4ft., and bears brilliant spikes of purple or white flowers.

Buckwheat does well on sandy and stony soils, and matures within a few weeks. For bees the flowers furnish a good harvest; for cows the plant is very attractive and nutritious; and all birds, including poultry, are passionately fond of the seeds.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Company report:—

April 1, 1902.

During March warm and cool spells alternated, though the weather continued very dry until about the 25th, when the drought broke, and on the 26th the best rain of the year by far was recorded, not only filling dams and tanks, but will also enable the farmers, at any rate in the mid-areas, to start ploughing.

Trade generally is a bit quiet, though the uncertainty as to what the tariff will be like when it leaves the Federal Parliament is causing some excitement and a few speculative movements. The abolition of the tea duty must give the Treasurers of the several States some trouble, though it is the opinion of many that the line will again have to be reinstated on the dutiable list. The maintenance of the partial recovery in price of copper prevents the threatened stoppage of a number of the small mining ventures. Some improvement in the prospects of one or two of the largest properties on the Tarcoola goldfield leads to the hope of a revival in interest there, though the great difficulty of water has yet to be overcome.

In breadstuffs the European market throughout the month has been very dull, demand for Australian cargoes particularly slack, American holders being anxious to quit their large crop. Generally favorable spring weather for the wheat crop in the Northern Hemisphere also does not favor improvement in prices. In Melbourne the market has remained almost stationary, but the tone in Sydney is better, and values in Adelaide have improved during the month. Nearly all the charters made previous to harvest have now been loaded, and shippers are counting up their losses, it being understood that they have had a bad time. Deliveries, however, by growers continue so very light as to prevent any downward tendency. Some half-dozen vessels are now on the berth for South Africa, carrying flour, wheat, and fodder. Local trade in flour is chiefly confined to supplying to contracts with bakers made early in

the season. Feeding grains are nominally 1d. higher, though trade has been confined chiefly to local demand. Only a few small shipments of chaff going to Sydney, and some oats also shipped eastward.

A sufficient supply of potatoes is coming forward locally and from the Mount Gambier district, and the quality of those grown in the Hills, near Adelaide, being exceptionally good for the time of year, they are selling at an advance on former quotations. Gambier grown, which this season will not be sufficient to carry us through to the next crop, eased somewhat, but have since recovered under the influence of the advance that has taken place in the eastern markets. Onions are still plentiful here, and though our market has improved about 10s. during the month, with the heavier crops reported in Victoria there does not appear to be likelihood of high rates ruling at any rate for some time to come.

In dairy produce lines, considerable business has been put through, a further advance in value of butter in Victoria being quickly reflected in this market. Good rains in New South Wales, and heavy shipments of New Zealand butter coming into Sydney and Melbourne, however, forced both those markets back a bit, so that only 1d. has held of the 3d. rise that occurred a couple of weeks ago. Melbourne easing in eggs, also affected this market, the sharp advance at close of February having been quite lost. We cannot help, however, thinking that values during the winter will rule high, the prohibitive duty preventing the usual importations from the east to Sydney. Good demand has continued for cheese, and stocks have lightened values improving about 1d. A better local supply of pigs brought down the raw material, and has caused a slight weakening at the moment in value of bacon. This, however, is only local, and likely to be temporary, as supplies are extremely scarce in the other States. A heavy turnover in honey has been made at the advanced price. Beeswax very short of demand. The new crop of almonds is very readily taken up at market quotations.

With the approach of the cooler season there is shown the beginning of the usual winter business in carcass meat, and we may expect in the course of a few weeks to see this trade again in full swing at our Friday's market. Prospects favor the realisation of good prices both for pork and veal during the coming season. Abnormally heavy catalogues of live poultry have been submitted at each of the bi-weekly sales during the past month, but the average quality was hardly up to usual, resulting in slightly weakened prices for fattening stuff, but well-conditioned table sorts fully maintaining previous satisfactory rates.

MARKET QUOTATIONS OF THE DAY.

Wheat.—Port Adelaide—Shipping parcels, f.a.q., 3s. 4d. to 3s. 4½d., f.o.b.; farmers' lots, 3s. 3½d. on trucks, per bushel of 60lbs.

Flour.—City brands, £7 15s.; country, £7 to £7 5s. per ton of 2,000lbs.

Bran and Pollard.—1s. per bushel of 20lbs.

Oats.—Local Algerian and dun, 2s. 3d. to 2s. 8d.; prime stout feeding white, 2s. 8d. to 3s. per bushel of 40lbs.

Barley.—Malting, 4s. to 4s. 4d.; Cape, 2s. 8d. to 2s. 9d. per bushel of 60lbs.

Chaff.—£3 to £3 5s. per ton of 2,240lbs., bags in, dumped, f.o.b., Port Adelaide.

Potatoes.—New locals, £5 10s.; Tasmanian, £6; Mount Gambiers, £4 7s. 6d. per 2,240lbs.

Onions.—Local Spanish, £5 5s. to £5 10s.; Mount Gambiers, £5 per 2,240lbs.

Butter.—Creamery and factory prints, 1s. 4½d. to 1s. 6½d.; private separator and best dairy, 1s. 3d. to 1s. 4d.; good store and collectors', 1s. 0½d. to 1s. 2½d.

Cheese.—South Australian factory, 7½d. to 8½d.; New Zealand, 8½d. to 9d. per pound.

Bacon.—Factory-cured sides, 7½d. to 8d.; farm lots, 6d. to 6½d. per pound.

Hams.—South Australian factory, 8½d. to 9½d. per pound.

Eggs.—Loose, 10d.; in casks, f.o.b., 11½d. per dozen.

Lard.—In bladders, 8d.; tins, 7½d. per pound.

Honey.—3d. for best extracted in 60lb. tins; beeswax, 1s. 2d. per pound.

Almonds.—Softshells, 5d.; kernels, 10d. per pound.

Live poultry.—Prime table roosters, 1s. 9d. to 2s. 2d. each; good hens and fair cockerels, 1s. 4d. to 1s. 7d.; a few coops of poor and light birds, 1s. to 1s. 2d.; chicks, 8d. to 10d.; ducks, 1s. 5d. to 1s. 9d. for ordinary; prime, up to 2s.; geese, 2s. 6d. to 3s. 3d.; pigeons, 4½d.; turkeys, from 5½d. to 7½d. for fair to good table sorts.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, flour, and forage for export are f.o.b. prices at Port Adelaide. Dairy products are city auction mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese.

MAMMITIS OR GARGET.—The udder should be poulticed with a large hot poultice, kept in place with a broad bandage over the back. Mix 6ozs. tincture of iodine, 1oz. tincture of opium, 4drms. soap liniment, and rub on two or three times a day. Give the animal cooling medicines.

CONFERENCE AT BUTE.

The Annual Conference of Northern Yorke's Peninsula Branches of the Agricultural Bureau was proposed to be holden at Bute on February 19, but the attendance was so meagre that it could not fairly be called by that name. This was partly due to the fact that a sitting of the land board was arranged for the same time at Kadina. The first session was to have been opened at 11 o'clock a.m., but the chair was taken a little after noon, with eleven persons present, increased to about thirty-two during the day.

Branches Represented.

Bute.—W. H. Sharman, A. Sharman, E. Ebsary, A. Schroeter, H. Schroeter, F. Trengrove, T. Trengrove, R. Commons, J. H. Brideson, J. H. Barnes, W. A. Hamdorf, M. Stevens, and D. McEvoy. Brinkworth.—A. L. McEwin and G. Freebairn. Pine Forest.—R. Barr, jun. Nantawarra.—J. Nicholls and T. Dixon, jun. Kadina.—D. Taylor.

Exhibits.

By Schroeter Bros.—Silver King wheat, and Algerian, Scotch Grey, and White Champion oats. By W. H. Sharman.—Marshall's No. 3, Ranjit, Gluyas Early, and Petatz Surprise wheat, and New Zealand oats. By T. Trengrove.—Dart's Imperial wheat and sheaf of same; the grain was plump and full weight, cut when in dough stage; the sheaf, cut later, was very badly rusted. By A. L. McEwin.—King's Early, Purple Straw, Petatz Surprise, and Smart's Pioneer wheat.

Chairman's Address.

Mr. McEwin, Brinkworth, was voted to the chair in absence of Mr. R. Barr, of Pine Forest, who arrived later on. Mr. McEwin shortly addressed the members and visitors and then called upon Mr. D. Taylor to read a paper written by Mr. W. H. Hawke, of Tiparra, to the following effect:—

RED RUST, AND A THEORY.

His intention was to combat the idea that the time of rainfall and its quantity had a great influence on the nature and vigor of the red-rust attack, and to offer a theory as to the cause of the rapid spread of red rust during some years whilst in other years the disease was not noticed, or, if present, little harm was done; also to offer suggestions in regard to combating the evil. Many people thought that heavy rains in spring were likely to cause spread of red rust, whilst others affirmed that early winter rains would have that result, but he hoped to show that neither contention was borne out by the actual records of rainfall. In the following table the record for 1867 was taken at Wallaroo and the rest for Tiparra, that for 1891 (which was a slightly rusty year) is omitted because the measuring glass of the rain gauge was broken.

Average rainfall for thirteen years—1883 to 1901 (except 1901)—April, May, June, and July, 8·83in.; August to end of November, 5·83in. There have been six rusty years, and this table shows the rainfall:

	April-July.	August-November.
	Inches.	Inches.
1867	8·46	4·54
1884	11·22	4·04
1885	7·58	4·61
1889	15·89	6·13
1890	9·33	5·96
1901	7·21	6·33
Averages	9·95	5·26

In 1867 rust was very bad; 1884, rust showed strongly, but was checked, and little harm done; 1885, bad rust, half crops taken; 1889, wheat mostly destroyed; 1890, little harm done; 1901, crops reduced one-half by rust.

There have been six years with similar distribution of rainfall but no rust produced, viz. :-

	April-July. Inches.	August-November. Inches.
1883	12.43	6.64
1887	8.52	5.24
1888	7.70	2.11
1893	13.76	6.24
1895	8.84	5.16
1898	13.02	6.74
Averages	10.71	5.02

During four years the heaviest rains were in the second period, with no rust, viz. :-

	April-July. Inches.	August-November. Inches.
1886	4.02	5.24
1892	7.40	9.97
1894	7.45	7.60
1900	5.80	5.81
Averages	6.17	7.16

In October, 1892, 4.29in. fell; in October, 1894, 3.20in. fell. We had no statistics of rainfall for 1867, the first great red-rust year in South Australia. The rainfall in 1892 was—April, 0.90; May, 1.00; June, 1.95; July, 3.53; August, 3.04; September, 2.28; October, 4.29, and not a sign of red rust.

His theory as to cause of rapid spread of red rust in some years was that it was favored by changes during winter and spring when accompanied by electrical disturbances. This was the case in 1867, a dry August, terrific squalls and hailstorms in October. The year 1901 was a fair repetition of 1867, rainfall and all. Again, 1885, which was a rusty year, although dry, was characterised by electrical disturbances; the spring was threatening with rain which did not fall, and the latter part had much thunder and lightning and calm weather. The crops were attacked rather late, the rust spread with great rapidity, grain ripened quickly, and was much pinched—returns reduced by one-half. In 1889 the rainfall was very copious, but by far the larger portion fell during the first six months, but October and November fall was below the average. During October thundery conditions prevailed, the weather being calm, close, and muggy, with south-east winds frequently at night, laden with sea mois ure in this district, and when red rust attacked the crops just coming into ear, the result was disastrous. Farmers in this district have come out this year much better than in 1889, probably because they now sow more of rust-resistant and rust-escaping varieties, and phosphatic manures force the crops on during the cold months, so that they are more forward when the rust attacks them. That seemed to prove that thundery weather accompanied with more or less rain, and followed by close, cloudy, muggy atmosphere gives the necessary conditions for rapid spread of red rust fungus; and if thundery conditions set in during winter they are likely to prevail throughout the year, and rust will ensue. If this theory holds good farmers could so prepare their land that they could out the riskiest crops for hay and refrain from ordering costly implements and machinery for which there will be no need owing to presence of red rust. It has been found possible to raise rust-resistant varieties of wheat that are not flinty and that are approved of by millers and wheat buyers, and there are several early-maturing, rust-escaping sorts, both of which should be grown. The rust-resisting, which are usually late, should be sown first, and the rust-escaping sorts should be sown later on.

A short discussion ensued, chiefly laudatory of the paper, and an adjournment was made for lunch.

AFTERNOON SESSION.

Mr. R. Barr, Pine Forest Branch, took the chair, and called upon Mr. G. FREEBAIRN, of Brinkworth Branch, who read a paper to the following effect:—

HOURS OF LABOR ON FARMS.

Hired laborers on farms so often remarked that they do not like to work for farmers because they have to put in fifteen hours a day that he had kept an account of the actual time that one of his men worked. They commenced at 6.30 a.m. and knocked off at 7 o'clock at night. Three hours off for lunch in the morning, dinner midday, and a snack in the afternoon reduced the period of labor to nine and a half hours a day. He was loading hay, eight loads per day. It took twenty minutes to put on a load and thirty minutes to throw it off. On windy and wet days nothing could be done with the hay, but the wages go on whether the man is working

or not. The man referred to had been on a Government job for three months, and had not saved enough to pay his rail fare to Adelaide; but at the end of one month on the farm he had enough for his rail fare and a cheque for £3 16s. in addition. At harvest time eight acres is a fair day's work in stripping a wheat crop, and that can be done in less than eight hours. Steering a stripper is very easy work, and could be done by a farm boy of 15 or 16 years of age. There are damp days during harvest time, when work cannot be started until 10 o'clock or 11 o'clock. At seed time no team usually works longer than seven and a half hours at the utmost on the soft land, and in this work there are days when the man cannot work, but his pay and keep goes on as usual. Of course the team has to be fed and attended to, but this can hardly be called labor. Farmers themselves are too prone to assert that theirs is a hard life, with long hours of labor, and they discourage the young people by so doing. Why, nearly all the implements nowadays have seats: the flail, the scythe, the reaphook, and many other cumbrous backaching contrivances of olden times are done away with. There is a great deal more of freedom and independence in farm life than in that of the city. There is plenty of good food of several kinds, and many days off work can be taken at times when work can be put off without serious loss.

Some speakers asserted that farmers have to work fifteen hours a day, but others admitted that these long hours of labor occur only at harvest time, and on an average of the year round eight hours is the limit. Some farmers talk as though they are the hardest worked people on earth, but when there is anything inviting away from the farm they usually find time to be there. One who had been a teamster said he used to work fifteen hours a day for several years, but on being cross-questioned admitted that this included all time between rising from bed and getting between the blankets again. Feeding and grooming horses, harnessing, &c., could fairly be called work. He picked up a good deal of weight when working so hard, and was losing it now he had less to do and shorter hours. Another member said farmers were obliged to dispense with hired labor except when there was much work to do, and then they paid good wages for long hours. When work was slack the laborers went shearing or to other work. If they received rather less money on farms it must not be forgotten that they got bed and board, and could save most of their wages, which was hardly possible where they had to pay rent and provide their own food. The consensus of opinion appeared to be that the average of hours of labor on farms does not exceed eight, but when crops have to be harvested or urgent work is needed the period may be considerably extended.

STANDARD OF FAIR AVERAGE QUALITY.

Mr. R. BARR read a paper relative to the fixing of the fair average quality of each season's crop of wheat by the Corn Trade Section of the Chamber of Commerce. He advocated a permanent standard of 63lbs. weight in an imperial bushel measure to be called first grade, and 61lbs. to be second grade. If any wheat should weigh more than 63lbs. per measured bushel then something above first-grade price should be paid for every 60lbs. of such grain. For every pound weight below 61lbs. in the measured imperial bushel a corresponding reduction on first-grade price should be accepted. He could not see the equality of the practice of docking 1d. per bushel on wheat weighing under the standard, whilst the buyer paid only ½d. per lb. on wheat of standard quality. Then the standard of 62lbs. f.a.q. was fixed late in the season, and after a deal of the grain was already sold on the previous year's standard of 63lbs., so that anything under 63lbs. was "docked" 1d. per bushel, whilst those who held on to their 62lbs. wheat got full "standard 62lbs." price for it. Now he had stored a quantity of wheat weighing 59½lbs. per bushel, which was subject on January 1 to a reduction of 3½d. per bushel, but when the "standard," on January 8, was reduced to 62lbs. that wheat should have been "docked" only 2½d., and he considered that the purchasing firm which held his wheat was in equity and justice bound to pay him the difference. When grain is light through red rust, hot winds, drought, or other uncontrollable causes the farmer cannot be blamed, and should not be penalised, but if he is careless in cleaning his wheat he must expect to get a lower price. Many thousands of bushels of wheat bought with a dock of 1d. to 2d. per bushel have been shipped as the season's f.a.q. standard, and the merchants have pocketed the difference, because the over-standard-weight grain has equalised the bulk. When a leading wheat merchant in this State says "If you fix any standard or make any rule relating to wheatbuying other than I approve of I will not recognise it," it is time to take steps whereby the whole system shall be worked according to law and order. The standard in Victoria this season is fixed at 61lbs., and Victorian wheat is worth as much in London as South Australian. So long as a cargo of wheat from South Australia reaches an average

weight of 61 lbs. per bushel—notwithstanding that the grower has been docked 1d. to 3d. per bushel—it will sell in London at the same price as is given for Victorian wheat. The little testing tubes and scales used by wheatbuyers are not at all satisfactory, as the same sample tested by different agents will give different weights per bushel. An imperial bushel measure should be used in all cases.

The discussion turned mostly upon a recapitulation of the remarks in the paper, illustrated with personal experiences of the ways of the wheatbuyers.

The Chairman then called upon the GENERAL SECRETARY to read a paper by Mr. J. P. Rooney, to the following effect:—

FALLOWING AND HARVESTING.

When serving his apprenticeship as a gardener and afterwards when steward on an estate in the old country he was taught by the head gardener, and was informed by the publications of innumerable standard authorities, that the more that soil is exposed to the atmosphere the better. Frost and snow permeates the soil and sweetens it. But in Australia the conditions are reversed, and after ploughing it is necessary to break the soil down as fine as an onion bed. There is no doubt that fallowing on all but shifting sandy soils is the best in this State.

In regard to harvesting he was convinced that the most profitable and rational way is to reap and bind it when the grain is in the advanced dough stage, and then to thrash with a header, unless a thrashing machine and gang can be employed. The straw is then of considerable value for feeding stock. This year he reaped sixty acres of Californian Purple wheat just when the grain was hardening, and the straw is now quite green in color and nourishing in character, whilst the grain is better than that from the rest of the crop that was left to get dead ripe for stripping.

In discussion it was suggested that the reason for turning up the soil roughly in Europe is to keep it comparatively dry and warm, so that the soil microbes may multiply and exercise their beneficial influences on the organic constituents, and thus promote more rapid nitrification. In Australia it is necessary to endeavor to maintain a moist condition of soil, and if this is done the natural warmth of our climate will favor a most rapid multiplication of those beneficial microbes, so that as far as cereals are concerned there is little need for the application of nitrogenous manures.

The next paper was by Mr. J. NICHOLLS, of Nantawarra Branch, entitled "Sheep on the Farm." This, however, was merely a repetition of the able paper read before his own Branch and printed in the *Journal of Agriculture* in September last. In discussion some reference was made to sheep enclosed in paddocks with not a particle of shade whilst the open-air temperature was about 160° F. and registered shade temperature 112° F. One member asserted that sheep will not seek shade even under such conditions, but prefer to stand close together in the sun and cool their noses with the breezes which he said always blow between their legs. Several speakers said more money can be made from lambs than from mutton and wool. Sheep clean the farm and provide meat. Another member said it will not pay to raise lambs on a farm that is distant from rail and freezing works.

TIMBER.

Mr. A. L. McEWIN, Brinkworth, read a paper to the following effect:—

I have felt it almost a duty to take up this subject, as probably no part of the colony where agriculture is carried on so extensively will in the distant future be so far removed from the heavily-timbered country, so that timber for fencing looks to some as if it was going to be a serious matter, and hence it is excusable if you meet some alarmist who looks forward fifty or 100 years, and wonders what the coming generation will do. Mr. Krichauff, in his papers on "Forest Planting and Timber Supply," unwittingly proves that there is no cause for alarm. Timber cutting has been going on for the last 4,000 years, and if it should go on for the next 4,000, according to the statistics given by Mr. Krichauff, there certainly will be timber. The whole thing resolves itself into supply and demand. The Peninsula people need not be alarmed; as long as there is ground to be fenced there will be timber got for fencing, and reasonably cheap too. The present price of posts is unreasonable. The labor only is paid for, the timber is given away. Gum posts can now be obtained at less than 60s. (fifty shillings) per 100 at the stump. How much margin is there after labor is paid for? I understand that at Bute firewood ranges from 7s. to 9s. per ton on trucks. If a man had to make a living at it, paying for all labor, cost of wear and tear, horse feed, it would be a very hard one. Having proved that timber in itself at present is of no value to the owner, let me ask why is this

pessimistic cry about the want of timber and the colony spending thousands of pounds yearly in tree-planting, and thousands of pounds worth annually being burnt for clearing purposes? In a paper which I read at Brinkworth on "Do Trees attract Rain," I stated that in my opinion they did not; not a single instance has been cited to prove differently, and the rainfall statistics in the January number of the *Journal* bears my statements out; in fact this last decade of the colony has really had more wet years than dry ones. The Government have been and are still spending thousands of pounds annually on treeplanting, and where? The trees they have been planting! Of what commercial value are they? We see reports of them being worth so much per tree; but how much would they fetch commercially if sold? As much as the ground was worth, and probably not so much, if the trees were off it. I know of land that the Government are letting at 4d. per acre within twenty-five miles of Adelaide, at present with beautiful timber on, and the lessees are just ringing and cutting down as they can conveniently. The land if cleared would be worth 4s. or 5s. per acre. But what I want to draw attention to is this destruction the Government are actually allowing, and at the same time spending thousands of pounds annually on tree-planting on what never will even make decent firewood. I speak of the gums, pines, &c., which the Government are raising and planting annually.

In the January number of the *Journal* is the gist of a paper which I read at Brinkworth, which is fairly correct except in stating that there were large plantations of trees round Mr. Fisher's property at Crystal Brook. I spoke of the plantations made by Mr. C. B. Fisher on Hill River Estate before Mr. Angas bought it. I referred in that paper to the dryness of South Australia, and the fact that it is not mountainous enough for extensive timber-growing, also that the gum is the only timber we have worth speaking about, and that if the Government wish to conserve timber it would be economy to buy the land already timbered and conserve the natural forests which are in the hills, and are only adapted for intense culture of some kind. Take a tree away from its natural conditions and it will never do. This especially applies to forest timber of every kind.

There was a short discussion, in which some speakers did not support many of the contentions advanced by Mr. McEwin.

CO-OPERATION.—Mr. D. McEvoy read a short paper giving his ideas as to how co-operation would help producers.

CONCLUSION.—It was resolved that the next Conference shall be holden at Brinkworth, and general votes of thanks closed proceedings.

CONFERENCE AT MANNUM.

The Third Annual Conference of Murray River Branches of the Agricultural Bureau of South Australia was holden at Mannum on February 25 and 26, 1902, in the Institute Hall, Mr. J. G. Preiss in the chair.

Branches Represented.

Mannum—Messrs. J. G. Preiss (chair), B. Baseby, J. W. Walker, F. E. Schuetze, R. P. Scott, A. Faehrmann, J. A. Schulz, R. Heidrich, C. A. Ramm, J. W. Haby, and G. Lenger. Bowhill—E. Weyland. Gumeracha—W. Jamieson, M.P., W. Cornish, D. Hanna, and W. Lee. Mount Pleasant—H. A. Giles and G. Phillis. Murray Bridge—W. Lehmann. Visitors—A. Molineux (Gen. Sec. Central Bureau), H. A. Dowdy (District Inspector of Stock), G. Jeffrey (Wool Instructor, School of Mines), and about fifty farmers and others.

Exhibits.

By Mr. F. E. Schuetze—Seven varieties of grapes, William's Bon Chretien pears, Cleopatra apples, Purple brinjals, and Physalis Franchetti. By Mr. Giles—Gluyas wheat in sheaf, said to be perfectly rust-resistant. There were several other small exhibits by members.

Chairman's Address.

Mr. J. G. PREISS was much pleased to welcome so many delegates and visitors. These annual reunions always resulted in good to all, owing to the exchange of experience, practice, and ideas. The past season had been disappointing; the rains were late in coming, scanty, followed by dryness, which malted the seed,

and much had to be resown. June and July gave a fair amount of rain, but after that very little fell, and poor crops were harvested where fertilisers had not been used. Where super. had been applied as much as 12bush. or 13bush. per acre had been secured, but the average of the district was between 3bush. and 4bush. Now this average was not due to soil and rainfall alone—perhaps the clay soils required more moisture, but the average should have been higher. Some people seemed to believe that drilling super. with wheat would favor the wheat and not the weeds, but the super. helped the weeds as well. Where it is possible wait until the weeds are up, plough them under shallow, cultivate, and then sow the grain. The dairy industry had fallen off in quantity for export owing to drought and absence of herbage. Dairymen should not wait to see if the natural grasses are about to grow, but should make sure of food for their stock by sowing barley, oats, &c., on portion of their stubble lands. If the straw is long take it off with the horse-rake, then disc the seed in very early.

Mr. CORNISH said there are not many who know when to sow or what manures their land may require. Rain may come early or late, and land differs greatly, even on a single farm.

Mr. FAEHRMANN said farmers must sow with the first rains and take the chance of the grain malting.

Mr. LEHMANN.—Farmers must use their brains as well as their muscle. Murray Flats farmers cannot fallow when the dry winds carry the loosened soil on to neighboring farms; they must wait until the rainy season, and get their sandy soil covered with a crop.

Mr. DRAGOMULLER sowed his crops last season without manure, and got 2bush. per acre. His neighbor used a little super. and got 12bush. per acre. His crop was poor in appearance as well as in yield, but his neighbor had a strong plant and high color.

The Chairman called upon Mr. W. JAMIESON, M.P., who gave an address to the following effect:—

HOW TO KEEP OUR YOUNG PEOPLE ON THE FARM.

It is almost universally admitted that a very great many of our young people leave the farms when they become old enough to shift for themselves, and these are usually the most intelligent, active, and enterprising of our young people. They get away to Broken Hill, Westralia, or seek employment in banks, shops, warehouses, factories, or try to secure Government billets of some kind—anything in preference to farm life. Why do they do this? Some say it is due to the succession of bad seasons and low prices for all kinds of farm produce; but even without those causes many hundreds would still have left their country homes. The fact is our young people develop quickly, and find farm life too slow. The glamour of the city and towns is attractive, and they think they will have short hours of labor, good pay for it, and no end of leisure and amusement. They are full of animal spirits, with robust health, and the staid older people are not always in sympathy with them, but expect their children to run in the same groove with themselves. How can this evil be remedied? A return of good seasons would induce some of the young people to stay on the farm, but this is not within the control of man, though it may be admitted that better crops and more payable results can be ensured in many cases by the adoption of a better system and cleaner and more rational methods in conducting work on the farm. Then parents are likely to fail in noting the advance in intellect and knowledge of their children. They treat them all along as children, and do not show sufficient sympathy with their ideas and aspirations. Why not give them a direct personal interest in the farm? Let them have a few acres to cultivate on their own account, let them rear a few animals for themselves, give them an insight into all the work of the farm, buy and sell a little in the market. If they make a bad bargain, show them in a kind and sympathetic way how they could have done better; if they make a good one, give them all the credit of their business ability. They should know the prices going for everything connected with the farm, the best kinds of implements and machinery, and the defects, if any, in certain kinds of implements, tools, animals. Let the young fellows have the best team and the best machinery to work with. It breaks a lad's heart to see the hired laborer driving the best team and using the best implements whilst he lags behind with the worst of everything. See that there is no scarcity of good books and papers, especially of the best upon farm work, poultry, horses, cattle, sheep, pigs, machinery, and the like. Above all let the young people have young companionship, let them attend

literary society meetings, institutes, &c. Give them reasonable time and opportunities for recreation, make the home as pleasant as it is possible to be, and if all this is done the city and towns will not possess the allurements that at present offer themselves to the fancy of the dull-living farm youngsters.

In discussion it was remarked that some farmers are too prone to cry "stinking fish" at home and abroad. There was no disputing the fact that there are long hours and hard work at some seasons, but there are times when it is possible to take it easy, to have a few days of leisure. Very few employes in towns can get away from their work; and, if they do get a little more money, they have to spend more in dress and for their keep. Farmers could not pay their sons and daughters such wages that they must pay to hired laborers; but although laborers on Government works got higher pay than on farms, yet with board and lodging added the laborer was better off on the farm than on the Government work. Still, the boys and girls should not be required to work Sundays and week days for their bare food and clothing. One member remarked that he did three times as much work as an ordinary laborer on the farm. Another said farmers' children sometimes are better educated than their parents, and may feel somewhat ashamed of the "rough-and-tumble" life at home. Efforts should be made to put a little more neatness and comfort in such homes. The Chairman was proud to be a farmer; life on the farm was being made easier day by day. There were seats on nearly every implement he used. He certainly thought that the parents were often to blame for the children wanting to leave the farm. Make the life more pleasant and easy for them. The farmer can take a holiday whenever he decides to do so. He has no master to control him. At one time every colonist was for going on to the land; now, from the talk, one would think they all wanted to leave it. With brains, improved machinery, and practice, and with the use of fertilisers the farmers would be more prosperous, and this would attract people from the towns and keep the young people from wanting to leave the farms.

Mr. JAMIESON, in reply, said—No true farmer ever cried down his occupation. The time has gone by for working incessantly during long hours. Farmers now use their brains and improved machinery. Some definite arrangement should be made to reward the young people for their labor. "Some day" is too far ahead.

The Chairman next called upon Mr. H. A. DOWDY, District Inspector of Stock, who read a paper to the following effect:—

DRY BIBLE.

After more than a year's anxious experience in the Southern District, he was perfectly convinced that the greatest scourge to which cattle are subject is that known variously as "dry bible," "impaction of the omasum," "acute indigestion," "fardel bound," "maw bound," "vertigo," "manifolds," "staggers," "stomach or grass staggers," "blue bound," "pech bound," "grunting rag," "swimming in the head," &c. The loss sustained by cattle owners in the Southern District last year from this variously-named disease was appalling. It is especially prevalent during protracted summer droughts, when wholesome herbage is scanty, dry, and lacking in nutriment. At such times cattle and sheep are impelled to eat herbs which, although not poisonous in the ordinary sense, yet possess properties quite unsuitable to the digestive organs, and act upon them with almost the same deadly effect as an actual poison. There are various plants which grow rather numerous in the district that are known to be distinctly poisonous. Are there others which are not known? Even the useful sorghum is admitted to have killed cattle wholesale at times, though in innumerable instances cattle have fed upon it from its earliest stages until it has reached full maturity without the slightest evil consequences. He had watched the symptoms of dry bible and observed the *post-mortem* appearances in every stage of its development and in all parts of South Australia. Occasionally the disease kills within twelve hours, or less, after the first symptoms are observed; at other times the animal may linger for several days and then die, or it may make a slow recovery—the result, in the absence of treatment, depending almost exclusively upon the nature and quantity of unwholesome matter taken into the system.

The disorder has occupied the attention of investigators in all parts of the world, some ascribing the trouble to impaction of the third stomach (omasum); the food in that place is

frequently found to be abnormally dry after the animal has been ill for some days. Others—with whom he agreed—contend that constipation does not exist as a first condition, but is caused by an inflamed condition of the stomachs, especially the fourth (abomasum), and affecting also the intestines. They hold that the inflammation brings on a loss of function; and, to a certain degree, paralyses the whole digestive tract; and, of course, the dryness of the ingesta (food) follows in the omasum. He had made many *post mortems* in such cases where no constipation was present: in fact, where the deaths are comparatively sudden there is seldom any impaction found. If “dry bible” or “impaction” is a distinct disease one would naturally expect to find constipation a prominent feature in all cases of the disorder, but this is certainly not so. In every case *post-mortem* examination showed the mucus membrane of the fourth stomach highly inflamed, and he concluded that the mischief is of a true gastric nature.

Symptoms.—The first sign is uneasiness, when the appetite may or may not be impaired; then follows dullness and general dejection, the head and ears hang down, rumination is stopped, and the milk of cows will be considerably diminished; the nose becomes dry, and the skin harsh, with staring coat. Respiration may be slightly hastened, and temperature a little heightened; the eyes bloodshot, and tears may escape more or less freely. The animal may grunt or moan as it breathes. The nose sometimes turns towards the flank; there may be slobbering from the mouth, and in severe cases the tongue may protrude. There may be tympanitis or hoven, due to indigestion. Should the brain become involved there will be stiffness of the limbs and an awkward staggering of the hind quarters. In some cases the animal may strain violently when inflammation has extended into the intestinal canal. The intensity of the symptoms depends upon the severity of the disease.

The treatment should aim to modify the inflammation, and sedatives should be used—such as belladonna, aconite, bicarbonate of potash, and a few moderate doses of oil. Avoid powerful purges and stimulants. The worst cases will terminate fatally, no matter what remedies are used. Copies of prescriptions and treatment that have been found most efficacious can be procured on application.

Questions elicited the names of several plants that are poisonous and reputed to be poisonous. Native tobacco (*Nicotiana suaveolens*), *Pimelias* of several varieties, and *Logania* are distinctly poisonous. *Lotus australia*, *Swainsonias* of several varieties (including Darling pea), and *Euphorbia Drummondii* may be poisonous during certain stages of growth, but often cause tympanitis (or bloat, hoven, blast, blown, &c.), through excessive generation of gas when eaten rapidly on an empty stomach. Where superphosphate has been liberally applied on paddocks there seems to be much less disposition to “dry bible” and inflammation amongst stock, and a handful of fine bonedust mixed with bran or boiled grain three times a week appears to be very beneficial. Stock in paddocks naturally eat out all the best herbs and grasses, and finally there is little left besides the coarse, innutritious, and probably harmful kinds. One member had several cows die when they had feed nearly 3ft. high in the paddock, and plenty of good water. He took the rest out, fed them with 10lbs. a day of a mixture of chaff, bran, and molasses. He mixed 1gall. of molasses with 3galls. to 4galls. of water, and sprinkled 1gall. of this on 10lbs. chaff. He used copra sometimes as well as bran. Mr. Lehmann advised to make sure of green feed by sowing barley, oats, rye, &c., especially for early winter, when everything is dry, and very little of it. *Tamarix gallica* is an excellent standby to grow on sandhills, and sheoak is not to be despised. Mr. Giles urged everyone to make some ensilage. He always kept a good supply for his cows, and did not lose any from impaction.

The Chairman then called upon Mr. A. FAEHEMANN, who read a paper to the following effect:—

STURBLE-BURNING OPPOSED TO RATIONAL FARMING.

Rational farming he understood to be the raising and producing upon the farm all such crops and products that are best suited to the soil and locality at the least cost to the land and the occupier, and to make the best use of the whole of such crops. To be successful in growing crops the land must be properly prepared and afterwards cultivated. Where required manures must be supplied. As to what crops will prove to be remunerative must be decided by observation and experiment. If it is found that potatoes cost more to grow than they can be purchased for at the door, some other product must be tried. Murray Flats cannot produce first-class barley, but oats will do much better, and farmers there should grow the better

varieties in place of the wild oats. They will grow on land that is wheatsick, are not very subject to takeall, and should be largely grown as food for stock as well as for sale, and as an alternative crop with wheat. Often the farmer is compelled, through drought and failure in growth of feed, to buy at high prices food for his stock which he could and should have grown for them. Wheat is the only crop grown by many farmers, and the grain and chaff is gathered with the stripper whilst the straw is left on the field until a hot dry day occurs, when the fire stick is put amongst it, and in the evening the farmer congratulates himself if nearly every straw has been swept off his land. This has been going on since the foundation of this and the other Australian States, and is still practised to some extent. There is scarcely one farmer who has not thus been robbing his land of valuable vegetable matter, and thereby impoverishing himself also. Nearly everybody knows that decayed vegetable matter in the soil enriches it, maintains a proper "mechanical" condition or texture of that soil, and thereby tends to the development of heavy crops of good grain or other produce. When superphosphate is put on a field it causes a strong growth, with rich green flag, and this shows that strong straw and vigorous growth is conducive to heavy crops and good quality of grain. It is strange that when everyone knows all this there should still be so many who wantonly waste so much of the wealth of their soil by burning off all their straw. If a man were to set fire to his straw stacks his neighbors would deem it to be necessary to have him examined for a mental disorder, and probably have him put under beneficial restraint; but when they themselves burn hundreds of tons of straw that is already spread over their fields do they not display a much stronger sign of mental derangement? In this and other districts farmers are being scared through the drifting of their sandy lands, which, through repeated cultivation, is being deprived of the roots and fibrous matter which formerly held it together. With the aid of necessary and suitable manures and by ploughing under of the strong stubbles they may hope to restore the original state of things and prevent the drifting. Heavy clay soils would also benefit from the loosening effect of ploughed under straw - making it mellow and pervious to air, perhaps, in time, increasing the amount of humus, which is an active agent in the absorption of moisture from the air, conservation of moisture in the soil, and is no mean agent in the production of good crops of grain, rich in gluten. There is even a better use for straw than ploughing it under, viz., as food and bedding for the live stock; this involves carting in and stacking, feeding, and carting out of the manures made in the byres and yards; but it will pay to do this. Many of our old methods and most of our old implements have given way to improved forms and systems, and it is to be hoped that we shall continue to go forward. From his boyhood he had become convinced of the folly of burning his straw, but, like some others, considered it a necessary evil. Not long since a farmer had told him that he burned his manure, believing that this was better than spreading it on his land. Very many farmers think that by burning the heaviest portion of their crop they actually benefit their soil. It is to be desired that every farmer will seriously inquire into this matter, and make himself thoroughly satisfied that he is not seriously impoverishing his land and depriving himself of a valuable residual asset when he burns his straw.

In discussion it was elicited that straw is of greater value in feeding stock if it is chaffed, steamed, or soaked in water twelve hours, and of much more value if a little copra and molasses is given with it. Straw saves other fodder, and often would save the stock if they could get it. Mr. Giles said he never burns any straw, but leaves it on the field. If he wants to cultivate that field he gathers the straw into a long stack, and lets the cattle help themselves.

EVENING SESSION.

About sixty delegates and visitors attended in the evening, when Mr. George Jeffrey gave a short address on "Wool and Wool-classing," and then several ladies and gentlemen gave a musical selection. Proceedings concluded with light refreshments and a dance. Ladies were thanked for their kindness in catering.

In discussing Mr. Jeffrey's address it was shown that dipping paid for itself over and over. Tick-stained wool was broken, yellow, lacking in lustre, and much reduced in value. The sheep were miserable, neglect their feed, become poor and weak from teasings by ticks and lice, and by constantly rubbing themselves against the stumps and posts, tear out much of their wool. Both carbolic and arsenical dips are efficacious against ticks and lice. With respect to skins, take them off at once on killing, without adhering flesh; avoid cutting the pelt; spread in shady place, over a rail lengthwise, wool side under, with head part

and tail portion on the rail; paint flesh side with anti-weevil compound; avoid wrinkles in the skin by stretching it lengthwise along the rail. As to "freezer" lambs, the Dorset Horn and the Shropshire both are good. Value of Shropshire wool fluctuates. Half-bred wool is 1d. per lb. less value than Merino, and there is less of it. Lambs should all be sent off, either to the freezer or local market; it does not pay to keep the cross-bred lambs over. Do not trust to natural grasses for ewes, but make sure of some feed by growing it specially. Grow early crops of barley, oats, rape, mustard, or turnips. Feed on the turnip tops first, then hoe up the neeps or turnips. Bales of wool should weigh close upon 3cwts. 2qrs.

The Chairman (Mr. J. G. PREISS) read a paper to the following effect:—

PLOUGHS AND PLOUGHING.

The soil of this district cannot be responsible for the low average crops of grain, as it contains large stores of possible fertility. Insufficient rainfall towards the latter part of the life of the plant, imperfect preparation of the land, and poor tillage, have much to do with poor results. In this locality, too, the sandy light nature of the soil will not allow of following -- because the loosened surface would drift away during the dry season. The form of the plough and the quality of work it can do, therefore, becomes of importance, because we can plough but once in preparation for a crop. The plough that fails to bury ordinary plants does not accomplish all that it should do; but the chief object is to pulverise the soil and prepare a firm and level seedbed; the wheat plant cannot thrive in an open or lumpy seedbed, as the roots cannot exist in very open soils unless moisture is constantly there in moderate quantity. Failures have often occurred even in our friable soils through having been worked by a plough so constructed as to completely invert the furrow-slice without breaking it, leaving a hollow space between the furrow-slice and the subsoil. Such ploughs, although the work done may look neat, cannot be too much condemned. To secure the best results we must have a plough that completely buries all weeds, pulverises the furrow-slice, and packs the soil closely. The plough for this district is one of the stump-jumping kind, with at least three or four furrows, each cutting 8in. wide and up to 5in. deep. It should be constructed of best channel and spring steel, so as to be light and strong; but for heavier and stiff soils it would be well to have a stronger make of plough. The breast should be short and bold, overhanging on the furrow side, and should not drag on the bottom of the furrow, made of hardened steel, and polished on the outside. This sort of board would clean itself on most of our soils. The object is to pulverise the soil, and this can only be done by bending the furrow-slice on a curved surface, so formed that it shall also be twisted somewhat in the manner of a screw. The shares should fit well to foot and breast, and be made of good Bessemer steel, which will take a temper in water. They should be 6in. across the wing and polished on the upper side. The plough should run on three wheels up to four furrows, and anything over four furrows should have an extra wheel in front. The wheels and the edge of the share are the only parts which come into contact with the subsoil. There are no soles or side plates, and this prevents the formation of "hard pan," and also reduces the draught. The axle of the two main wheels should be so fixed as to enable alteration of the set of those wheels so that they will run a little towards the furrow side; this makes the plough to pack the soil closer and firmer, which is necessary when ploughing weedy land. One ploughing with such a plough in this district would make a good seedbed, ready for the drill. The best time to plough is after the rains have well soaked the soil and started the weeds--this will be about five or six days after the rain. Weeds are most easily killed when very young. Five inches in this district is about the best depth in most cases to secure good results; but less than that in some few cases may be desirable. Plough in plots rather than in lands a chain or less in width. When possible, make the plots at least twice as long as wide. This will leave it in better condition for the implements to follow, not having any gutters or deep water-furrows to cross, and it will be easier and quicker to get over the work.

WEDNESDAY MORNING SESSION.

Mr. J. G. Preiss took the chair at 10 o'clock, and called upon Mr. H. A. DOWDY, District Inspector of Stock, who read a paper, of which the following is the purport:—

DIPPING SHEEP.

By regulations made several years ago it was made compulsory on all sheepowners to dip their sheep for the suppression of sheep ticks (*Ixodes reticulatus*), and sheep lice (*trichodectes pharoccephalus*), in order to reduce the enormous annual losses caused by those parasites. But very many sheepowners neglect to obey the law in regard to dipping, and most of the time of

the inspector is spent in endeavoring to persuade these persons to do their duty voluntarily rather than to force them by the aid of the law courts to do so. In earlier days of settlement here the dipping to prevent scab served also to suppress the other two parasites, but latterly (scab having become extirpated), and sheepfarming being for a long time almost exclusively carried on by experienced men on large runs, who knew the value and importance of dipping to suppress tick and lice, there was but little loss incurred through their attacks. About thirty-five years ago sheep on the large runs in the South-East were very badly affected with vermin, which kept them poor, in bad health, and subject to numerous diseases, such as anæmia, lung worms, stomach worms, and various organic affections. But this state of affairs was not long suffered to continue, and good dips were generally in use. When the large runs were resumed by the Government, cut up, and put into the hands of inexperienced men, vermin soon became sadly prevalent. Then, in the South-East in particular, as well as elsewhere in general, farmers have begun to keep sheep. Now the experienced sheepowner fully recognises the losses on value of the wool, and the serious effects upon the health of his sheep if he allows tick or lice to invade his flocks, and he dips them regularly at the proper time; but it is the careless or inexperienced small owner of sheep who neglects altogether to dip them, and thus, to a considerable extent, neutralises the efforts of the large owner, and airily ventilates his opinion that the vermin spontaneously appear because the sheep are poor. They might just as well assert that the vermin create the sheep. There is no doubt, however, that vermin breed more rapidly and abundantly on animals poor in health and condition than on those that are fat and healthy. Where sheep are so infested it is certain that there is bad management, and undoubtedly much loss through discoloration of the wool, break of fibre, loss in quantity, and deficiency of lustre, added to poverty in the animal and impaired health. A dip capable of treating a few thousand sheep can be built for £25, and sheep can be effectively dipped for 2s. per 1,000. The liquid dip must be maintained at the proper level by the addition of more dip, ready made, not by filling with pure water, and mud must not be allowed to collect to any great extent in the dipping-pool. [Mr. Dowdy then read sections 71, 73, 74, 75, and 76 of the regulations making the dipping of sheep compulsory.—GEN. SEC.]. The penalty for neglect of any one of those regulations is not less than £5 nor more than £100, or imprisonment for not exceeding twelve months with hard labor. He added that he had recently received instructions from head quarters to prosecute offenders in every instance where infringements of the law came under his notice.

The first questions in discussing the paper were in reference to spear grass seeds injuring sheep's eyes, and to ovine ophthalmia. Mr. Dowdy mentioned a treatment recommended in a leaflet obtainable from the Stock Office. In respect to spear grass, it was recommended by one speaker to mow the grass before the seeds are formed, rake the grass into rows, and the sheep will eat it all. Another said it was a good plan to put eyebolts on the end of a long beam, drag it across the paddocks, and knock the seed heads down before letting the sheep in. It was stated that cultivation will not kill the spear grass. In regard to ticks, it was mentioned that the old ticks drop off the sheep when they are shorn, but young ticks and eggs remain. If the sheep are dipped a fortnight or three weeks after being shorn, the young ticks that remained and those that have been produced from the eggs are all killed before they are old enough to commence breeding. The dip for 1,000 sheep would be about 4ft. 6in. deep, 2ft. wide at top, and 10in. wide at bottom, and should be kept filled to within 18in. of the top, with a draining stand at the end. A farmer named Goslin made a dip at a cost of £15, and dipped 1,000 sheep between 7 a.m. and 3 p.m. The sides of the dip should be marked to show 50galls., 100galls., 150galls., and 200galls.; then fill in sufficient water and add the right quantity of dip powder to make it up to the proper strength.

The Chairman asked Mr. W. LEE to read a paper, but he had not prepared one, and made a few remarks to the following effect:—

DAIRYING.

South Australia can produce a better quality of butter than can be made in Europe; its climatic conditions are far more favorable, and its herbage and grasses are richer, owing to its dry warm climate. There is no necessity for stabling and stall feeding during any part of the year, as is the case in Europe, and green feed can be grown or secured for nearly, if not quite, all the year with the aid of ensilage. This is especially the case with settlers on the Murray River, where the swamps and islands are covered with green feed, either natural or cultivated, at all times. One great necessity with dairy farmers is scrupulous cleanliness in everything

connected with milk and the buildings and receptacles into which it is placed. The cream of to-day should never be mixed with that of yesterday. Dairy inspection is sadly required. The duties of inspectors should be much in the way of advice and persuasion, and very little in the form of persecution, except in flagrant neglect of ordinary sanitary precautions. Improvement of dairy herds is required. Jerseys and their crosses do not give quantity, though the quality of their milk is better than that of mixed-breed cows. The first cross between a Jersey bull and milking strain of Shorthorn cow would generally give satisfaction. It will pay well to stall the cows at night, and to rug them at night during the coldest part of winter. This saves food, increases the yield of milk, and contributes to the comfort and good health of the cows.

As the hour of the steamer was close at hand there was very little discussion, but Mr. Giles said the drought had so diminished the food supply that farmers had been compelled to sell their cows. Still, dairying will pay better than wheat-growing if the owners will grow food for their cows.

Conclusion.

A comprehensive vote of thanks was accorded by acclamation to the Mannum Branch (as conveners), to the Chairman, the ladies who had provided refreshments, to those who contributed music and songs those who had read papers, and to the delegates and all visitors.

CENTRAL AGRICULTURAL BUREAU.

MONDAY, MARCH 17, 1902.

Present—Mr. F. E. H. W. Krichauff (Chairman), Sir S. Davenport, K.C.M.G., Hon. A. W. Sandford, M.L.C., Messrs. R. Homburg, M.P., R. Marshall, W. C. Grasby, Thos. Hardy, H. Kelly, W. F. Snow, and A. Molineux (Secretary).

Phylloxera.

Mr. HARDY directed attention to the necessity for stringent action in regard to imported plants, as it was their only safeguard against the introduction of phylloxera. Plants, except by post, should not be allowed to come into the State otherwise than *via* Port Adelaide. He moved that the attention of the Hon. Minister be again directed to the urgent necessity for stringent action in this matter. This was carried.

Making and Improvement of Wheats.

Mr. MARSHALL read a very lengthy paper on this subject, dealing with the losses from rust, the recommendations of the various Red Rust Commissions, the importance of the work of improving our wheats, and the action taken in other States and countries. The recommendations of the Rust Commissions dealt with the systematic work for the production and distribution of rust-resisting wheats. There should be a central station for the preliminary testing of introduced wheats, and for the production by cross-fertilisation and selection of new varieties, and these varieties would afterwards be forwarded to representative districts for further trial. Mr. Marshall said that as far as South Australia was concerned the department had done nothing to give effect to these recommendations. Besides the mere question of rust resistance, there was the quality from a miller's point to be considered. Although the American wheat weighed 6lbs. to 8lbs. per bushel less than ours a lower price was paid for Australian wheat. If we could increase it only 1d. per bushel it would mean £300,000 per annum more for our wheatgrowers. South Australian farmers pay too much attention to the appearance of the grain and too little to quality, with the result that we get too much starch and not enough gluten. This question was, in his opinion, of vital importance to South Australia, and it was the duty

of the Government to take the matter up. After considerable discussion it was resolved that it be a recommendation to the Hon. Minister of Agriculture to put into operation at an early date the suggestions of Mr. Marshall.

Mr. SANDFORD said it was a common charge against the Bureau that they did not see things to an issue, that recommendations were made at the meetings and then the matter was allowed to drop. He thought there was some truth in this, and the members should see that important matters were not shelved in this way. For instance, there was the question of the flour-testing mill purchased some years ago, but never utilised. He understood it was still lying at Roseworthy, and moved—"That in view of the advantages to be derived from the scientific and practical tests of our wheats, it is to be regretted that the flour-testing plant purchased at considerable cost has never been put to work, and that it be a recommendation to the Department of Agriculture to have the plant put up at an early date." This was carried.

Rust-resisting Wheats.

Mr. MARSHALL said many farmers still held the opinion that rust-resisting wheats were poor yielders and of inferior milling quality. This, however, was far from being the case; there were a number of rust-resistant wheats which yielded well and would fetch top price from millers and wheatbuyers.

New Members.

The following gentlemen were approved as members of the undermentioned Branches:—Inkerman, Mr. W. W. Mugford; Clare, Mr. Howard Adams; Pine Forest, Mr. G. W. Barnden; Quorn, Mr. J. W. Smith; Amyton, Mr. F. Mullett; Port Pirie, Mr. Thos. Bell; Morgan, Messrs. E. Hausler and H. Wohling; Koolunga, Mr. Wm. Aunger; Eudunda, Mr. Jos. Lampard; Boothby, Mr. W. R. McEwen; Reeve's Plains, Mr. P. Marshall; Renmark, Messrs. A. S. Johns and H. Showell; Mount Gambier, Mr. W. J. G. Clarke; Davenport, Mr. D. J. Brown; Port Lincoln, Rev. W. H. Howard; Ardrossan, Mr. G. Woods; Port Elliot, Mr. S. Inglis; Crystal Brook, Mr. Geo. M. Davidson; Carrieton, Messrs. Oscar Hall and David Davies; Mallala, Mr. W. H. Franks and Port Germein, Mr. G. F. Steintal.

Reports by Branches.

The SECRETARY reported receipt since previous meeting of seventy-one reports of Branch meetings.

REPORTS BY BRANCHES.

Rhine Villa, February 22.

Present—Messrs. G. A. Payne (chair), A. Mickan, W. Farey, T. Edson, W. Start, H. Payne, F. F. Payne, J. W. Vigar (Hon. Sec.), and one visitor.

TAKEALL.—Members were of opinion that takeall was always worst on loose light soil ploughed dry, especially on late fallow. Good rain in spring appears to check the spread. All varieties of wheat seem equally affected. Members have no experience of the effect of manures on the disease.

OVERSTOCKING.—Mr. F. F. Payne read a paper on "Overstocking Pasture Lands." Overrating the carrying capacity of the land was a frequent mistake. The more stock the land carries beyond a reasonable limit the less feed is the land able to produce in the future. The best grasses get eaten out and the removal of the natural covering of the soil allows the rain to run too freely instead of soaking into the soil, and carries off much of the fertile soil and

manure. Then the heavy winds do a great deal of mischief on overstocked land in dry localities, the feed and the surface soil both being blown away. Where the holding is large enough he would fence into several paddocks and feed off those on the west first, as any dry feed blown from the eastern paddocks would be caught on those previously fed down. It pays to stock lightly, as the better condition of the stock more than compensates for the lesser numbers kept. Take sheep; you will get more for the wool from a given number of sheep that are well kept than from a greater number than the farm will properly keep. Overstocking is particularly injurious to young stock; it will prove everything but economical to allow them to lack feed while they are growing. Paddocks should be fed down one at a time, and should be allowed to go to seed every few years.

Wilmington, February 24.

Present—Messrs. W. Slee (chair), M. Gray, F. Bauer, J. Lauterbach, J. Zimmermann, M. Bischoff, R. G. S. Payne (Hon. Sec.), and one visitor.

SEED WHEAT FOR FARMERS.—Questions of canvassing for assistance to farmers in the dry districts was considered, and it was decided that the Branch should not make any canvass of the district, but each member will do all he can to obtain donations. The sum of £2 5s., fees received for services of shorthorn bull, was donated to the fund being raised.

PUBLIC MEETINGS.—It was decided to endeavor to arrange for visit by some officers or members of the Central Bureau, to give addresses on matters connected with agricultural operations.

Port Pirie, February 22.

Present—Messrs. T. Johns (chair), H. B. Welch, G. Hannan, E. J. Hector, P. J. Spain, T. Jose, and T. A. Wilson (Hon. Sec.).

WHEAT EXPERIMENTS.—Mr. Jose tabled samples in straw and grain of World's Champion wheat. Planted in rich sand, in a crop of Early Para wheat, it stood well, grew strong, and produced good ears, but being late in ripening suffered from rust. He did not think it a suitable variety to sow in large quantities in this district. The Chairman reported that this variety with him was also injured by rust.

FRUIT-DRYING.—The Hon. Secretary read paper by Mr. T. Gambrell on this subject:—

Apricots.—Pick when fairly ripe, but not soft; halve and lay on trays for about half an hour, then sulphur them. Put the fruit out in the sun, covering it over when moist and at night. Be careful not to dry the fruit too much; it must be firm, but not hard and dry. When ready to pack, sulphur the boxes to destroy eggs, &c., of moths. **Peaches.**—Treat peaches the same as apricots. **Figs.**—Select the best and dip them in boiling salt water. When dried sufficiently, pack them, pressing the fruit into shape with the finger and thumb, using a basin of salt water to dip the fingers in. Put the fruit in a box in layers, and when full press well. The boxes should be sulphured before being used. **Plums.**—Dry plums slowly in the sun; if too hot cover with thin cloth, as too much heat gives them a bad color. **Currants.**—Cut the bunches carefully and dry on trays; the currants will be ready to pack in a few days. **Raisins.**—Let the bunches get thoroughly ripe, dry slowly in the sun, finishing them in an oven to give a good color. Dipping in lye hastens the drying, but the bloom is lost. For pudding raisins let the fruit be very ripe, dip in boiling lye and dry. Put up in calico bags for a while to sweat, then stalk and grade the fruit; afterwards pack in boxes. **Piemelon.**—Cut in slices about an inch thick; remove skin and seeds and dry in the sun. The melon will keep a long time, and is quite as good as the green melon.

PICKLING WHEAT.—The Hon. Secretary read extract from *Town and Country Journal*, recommending formalin at the rate of 1lb. to 50galls. of

water for pickling wheat; soak seed for two hours. Mr. Spain said he was informed that formalin had proved very successful at Roseworthy College Farm as a pickle for wheat.

CONFERENCE.—The Chairman referred to Conference at Crystal Brook, and condemned the practice of reading very long papers at such meetings. People got tired of hearing the reader, and there was no time left for discussion. As a rule most good was got from discussion following a short, practical paper.

Arthurton, February 20.

Present—Messrs. W. H. Hawke (chair), T. B. Wicks, M. Lomman, W. Short, S. T. Lamshed, H. J. Freeman, J. Welch, L. Crosby, J. B. Rowe, and four visitors.

STANDARD SAMPLE OF WHEAT.—Letter from Chamber of Commerce on this subject was read. It was unanimously resolved that in the opinion of this Branch the date upon which the standard was fixed was altogether too late, and that the reason given for delaying decision as to standard, *i.e.*, the lateness of the season, was not satisfactory.

EXPERIMENTS WITH FERTILISERS.—Messrs. Lomman and Freeman reported on various experiments with fertilisers on their farm. They wished to find out the difference (if any) in drilling the seed in after ploughing and putting it in with drill affixed to plough; also effect of applying extra quantities of manure. One block of 50 acres was drilled in with 50lbs. Purple Straw wheat and 100lbs. mineral super. per acre, the return being 57 bags of wheat weighing 56lbs. the bush. Another plot of equal area, receiving the same quantities of seed and manure put on with drill affixed to plough, gave exactly similar result. On 50 acres, where the manure was increased to 150lbs. per acre, the drill being used on the plough, the yield was 82 bags of wheat weighing 57lbs. per bush.

RUST IN WHEAT.—The Chairman read a paper on this subject [See report of Conference at Bute.—GEN. SEC.]

Morgan, February 21.

Present—Messrs. R. Windebank (chair), G. Ruediger, G. Wittwer, J. Pope, E. Jacobs, W. G. F. Plummer, and four visitors.

PINNAROO.—Mr. Wittwer gave an account of his visit to the country surrounding Pinnaroo. From Tailem Bend to Elwompa Well was good grazing country, but too stony for cultivation; on to Moorlands there are patches of good land and the poorer would return fair crops with the help of fertilisers, as the rainfall was said to be about 14in. On the good land the mallee and pines are larger. On to Polly Well, where the water is brackish, the land is rough; coming to Dingo Ranges, there are sandy rises with patches of Bay of Biscay ground, to the extent of one and a half miles between. About Parakee Well, and also Wow Wow, there was some good country for agriculture, spear grass 2ft. high being seen, and the mallee and pines were large. On the plains is seen tussock grass, and in the scrub a black-grass tussock. Sheep were in fairly good condition, but not so the cattle. At Parakee Well Mr. Burns was reaping his oat crop, which was 3ft. 6in. high; wheat, where it was free from grass, was 1ft. higher. Mr. Burns complains that he cannot get his produce to market and has to feed nearly all to his stock; 6cwt. per horse is considered a good load over much of this country. At Pinnaroo Mr. Harvey reaped only 2bush., the rabbits and growth of grass in the crop being

responsible for poor yield. In 1900 the rainfall was 14.75in., and in 1901 15.98in. Mr. Jacobs reported having visited the district in question and bore out Mr. Wittwer's report. The great difficulty seemed the absence of timber fit for building and fences. Other members also spoke. It was considered that the heavier lands should be portioned out with the sandy soils where possible. Sandy soils would yield best in dry seasons.

CO-OPERATION IN MARKETING EGGS.—The Chairman mentioned the advantages that would be gained by co-operating in sending eggs to market in one consignment. Discussion adjourned until next meeting.

Johnsburg, February 22.

Present—Messrs. T. Potter (chair), L. Chalmers, J. Reed, W. Buchanan, T. A. Thomas, and T. Johnson (Hon. Sec.)

FERTILISERS FOR WHEAT.—Mr. Potter reported on experiments with manures last season. Wheat drilled in without manure gave a profit of 9d. per acre over that broadcasted. One hundred and three acres drilled in with 31lbs. super. per acre yielded 122 bags, and 42 acres in same paddock, sown broadcast without manure, yielded at rate of 2bush. 51lbs., showing 1bush. 33lbs. per acre in favor of the manure. The rainfall was very deficient and the crops did not mature properly.

EARLY WHEATS.—Members reported on results from King's Early and Steinwedel wheats, the former having generally given the better results. Experiments in crossing the two wheats were being carried out, with a view to obtaining a variety combining the best qualities of both. Steinwedel wheat was reported to have degenerated considerably, and is much later in ripening than formerly.

Maitland, March 1.

Present—Messrs. J. M. Smith (chair), T. Bowman, A. Jarrett, H. R. Wundernitz, J. Hill, E. W. Moody, W. Wilson, C. W. Wood, W. Bowey, and one visitor.

HON. SECRETARY.—Dr. Nicholls tendered his resignation as Hon. Secretary, Mr. W. Bowey being appointed in his place.

WHEAT EXPERIMENTS.—Mr. Bowman reported on experiments with wheats received in 1900 from Central Bureau. They were planted in June and manured with 70lbs. super. per acre, with the following results:—

Marshall's Hybrid.....	31bs. sown, yielded 75lbs.
Rangit	31bs. " " 93lbs.
Silver King	31bs. " " 84lbs.
Majestic	14lbs. " " 43lbs.

The seed was sown again in June, 1901, on land manured with 50lbs. super. per acre. Marshall's Hybrid—70lbs. sown on $1\frac{1}{4}$ acres yielded 29bush. 11lbs.; variety ripens early, has good strong and rather purple straw. Rangit—87lbs. sown on $1\frac{1}{4}$ acres yielded 24bush. 28lbs.; straw, bright yellow, long and fine, and inclined to go down. Silver King—77lbs. sown on $1\frac{1}{4}$ acres, return 28bush. 53lbs.; good bright clean straw and stands up well. Majestic—40lbs. sown on $\frac{3}{4}$ acre yielded 12bush. 31bs.; straw bright and stands up well. He considered Silver King and Majestic practically rust-proof, and the other two rust-resisting. Other wheats in the same paddock were all more or less affected by rust, but very few spots could be found in the experimental plots. Mr. Bowman was thanked for his care and attention to the wheats and asked to carry on the tests for another year. He agreed to do this, and promised to offer any seed he had to spare to the members.

Dowlingville, February 21.

Present—Messrs. J. Phelps (chair), R. A. Montgomery, W. T. Holland, S. Tee, H. P. Crowell, G. Inkster, and F. Lock (Hon. Sec.).

HON. SECRETARY.—Mr. J. L. Broadbent tendered his resignation as Hon. Secretary, and Mr. F. Lock was appointed in his place. A vote of thanks was accorded to the retiring officer for his services.

TAKEALL.—This subject was discussed at length. It was agreed that the season made little difference to spread of disease. Light lands were affected most, and some members had found a heavy rolling when the wheat was shooting prevented the spread of the disease. Manuring appears to be beneficial, and some members report the heavily-manured land as less subject than where only a light dressing is applied. Sowing oats or peas on takeall-infested land appears to get rid of the trouble.

MEMBERSHIP.—Resolved to enforce rule *re* attendance.

Mundoora, February 21.

Present—Messrs. R. Harris (chair), W. D. Tonkin, W. J. Shearer, J. Blake, D. Owens, J. J. Vanstone, W. Mitchell, and A. E. Gardiner (Hon. Sec.).

WHEAT EXPERIMENTS.—Mr. Harris brought a bag of Allora Spring wheat for distribution amongst members. The wheat was very clean and the bag weighed 280lbs.

MANURE EXPERIMENTS.—Members expressed themselves as well pleased with reports in *Journal of Agriculture* of tests with fertilisers carried out by members of various Branches, as they were of great interest to farmers using manures. The results from use of superphosphates were very satisfactory, and it would be well for all purchasers of manures to note, as agents always say a lot about their own particular brands being best. Mr. Vanstone reported that his experience was that in this district a dressing of 50lbs. to 70lbs. of super. give equally as good results as 1cwt. per acre.

FALLOWING.—Mr. Vanstone called attention to an instance of the value of fallowing. Three years ago a neighbor of his fallowed portion of a paddock and ploughed the remainder just before seeding. The crop on the fallowed land was much better, and even now the feed on the land is superior to that on the land that was simply ploughed.

COST OF WHEAT-GROWING.—Members were considerably interested in paper in February issue of *Journal of Agriculture* by Mr. F. Masters, of Pine Forest Branch. Members would like to know where land that will produce 8bush. per acre can be purchased for 10s. per acre in farms of 1,200 acres, and who will guarantee an 8bush. average, as there are numbers of people who would be willing to take it up if the figures are reliable.

Arden Vale, February 24.

Present—Messrs. E. H. Warren (chair), M. Eckert, A. W. Fricker, P. Starr, and A. Hannemann (Hon. Sec.).

EXPERIMENTS WITH FERTILISERS.—The Chairman reported that he obtained $4\frac{1}{2}$ bush. per acre from a paddock of thirteen acres, sown with Allora Spring wheat and manured with 60lbs. mineral super. per acre. The unmanured crop alongside only produced 2bush. He considered Allora Spring and Bartlett's Crossbred wheats were suitable for this locality. The Hon. Secretary reported failure of experiments with wheats received from the Bureau, the dry

season being the cause. The rainfall for the years was only 9in., and the harvest the worst ever experienced here, members being of opinion that the returns from hundreds of Yarrah and Wyacca did not exceed 1½bush. per acre.

STANDARD BUSHEL.—Members are of opinion that the Chamber of Commerce should endeavor to fix the fair average quality standard earlier, or if this cannot be done some equitable adjustment should be made in respect to wheat purchased prior to fixing of the standard. This would be fair to both parties and prevent the injustice done this year to many farmers who have been docked for wheat that was up to the standard since fixed for the season. Members were also of opinion that, in seasons when the quality is doubtful, the Branch should procure necessary appliances for testing the weight of wheat. One local farmer took his wheat to three different buyers and in each case different weights were given. The Chairman directed attention to statement made at Petersburg at meeting of the Farmers' Union, that the wheatbuyers had made a compact not to run one another in price. The members were of opinion that, if the statement was correct it was the duty of every farmer to do all his business through the Union.

Koolunga, February 20.

Present—Messrs. J. Sandow (chair), J. Button, F. J. Shipway, G. Jose, J. Pengilly, T. Freeman, R. Lawry, R. H. Buchanan, and J. C. Noack (Hon. Sec.).

MILLING QUALITIES OF WHEAT.—A discussion took place on this subject, various opinions being expressed as to the cause of the alleged deterioration of our wheats. Several members were of opinion that if the wheat was properly clean the reputation of our wheat would be enhanced.

EXPERIMENTAL PLOTS.—Mr. Pengilly reported on results of his experiments and tabled samples of Ranjit, Silver King, and Majestic wheats. This makes the fourth member who has reported on last season's experiments. [Doubtless members of other Branches would like to know the results of the experiments. Whenever possible details of experiments should accompany report of meeting.—GEN. SEC.]

Morphett Vale, March 4.

Present—Messrs. H. Smith (chair), J. Bain, A. Pocock, F. Pocock, L. F. Christie, T. Anderson, T. Hutchinson, J. McLeod, and A. Ross Reid (Hon. Sec.).

FERTILISERS FOR WHEAT.—Mr. Bain reported on results of various experiments last season. Ten acres sown in April and manured with 2cwts. Chemical Works bone super. per acre with seed yielded 2 tons of hay per acre; five acres sown in May with same kind and quantity of manure yielded 18bush. wheat per acre; five acres sown in May and manured with 2cwts. Thomas phosphate per acre yielded 18bush. wheat per acre; five acres of Cape Barley manured with 2cwts. bone super. yielded 40bush. per acre. Plots were on sandy soil, fallowed. The first three had the seed and manure broadcasted and scarified in and the barley was ploughed in. White Tuscan wheat was sown on the first three plots; the super. and Thomas phosphate gave an equal yield of grain per acre, but if the plots had been cut for hay the super. would have yielded quite 10cwts. per acre more than the other. Mr. Bain stated that he had never had satisfactory results from use of manure on stubble land; other members' experiences had been the same. Mr. McLeod reported on experiments on

acre plots with different kinds and quantities of manures, the best returns being obtained from the heaviest dressings. He found the plots manured with English super. fully a week ahead of those receiving the colonial manure. Mr. Anderson tried Bally bonedust, but did not get any better result than from a lesser outlay of super. Mr. Smith advised using a mixture of bonedust and super., as by this method he considered that in time the land would be in such condition that it would be possible to get more than one crop in two years, as was usual in this district. He found that a crop of barley with short strong straw would generally yield better than one with long straw. Mr. F. Pocock advocated sowing oats on fallow land and wheat the following year.

FEEDING DOWN CROPS.—Mr. Pocock stated that a neighbor kept his crop eaten down very bare until August 13, so much so that he was afraid he had overdone it; the crop, however, came away well and yielded 2 tons 14cwt. of hay per acre. Members were agreed that feeding down with sheep was beneficial to the crop.

PICKLING WHEAT.—Mr. Bain said he had pickled wheat with bluestone and dried it with lime, then put it away for twelve months; when sown it germinated splendidly and the crop was very clean. Seed that was not dried with lime was not quite so satisfactory.

Eudunda, February 24.

Present—Messrs. J. von Bertouch (chair), H. Martin, R. Kluske, F. W. Paech, C. Pfeifer, H. D. Wiel, W. H. Marshall (Hon. Sec.), and one visitor.

EXPERIMENTS WITH FERTILISERS.—Matters in connection with experiments to be carried out on experimental block were dealt with.

DRAKE.—Mr. Martin said that in the third crop from new ground "drake" or "darnel" had appeared, the two previous crops being quite free; several farmers in the vicinity had similar experience and he would like to know the cause. [Drake or darnel (*Lolium temulentum*) grows from seed the same as any other grass; it is a distinct species and is most probably brought on to the land in seed wheat, dirty hay, or other material containing seeds. Most of these escape the stripper, and thus the land is fouled.—GEN. SEC.]

Elbow Hill, February 25.

Present—Messrs. T. J. Brooks (chair), H. Dunn, W. C. Ward, J. F. Robertson, S. Pike, W. Tynan, J. Wake, G. C. Dunn (Hon. Sec.), and seven visitors.

POULTRY.—Mr. W. C. Ward read a paper on "The Best Fowl for the Farm." He favored better birds than were usually kept by farmers, and for laying purposes the Minorca, Spanish, and Leghorn were best, though they made poor table fowls. He had known Leghorn hens to lay at five months old, and to keep on for eight or ten months during the year. He found these birds degenerated very quickly unless fresh blood was introduced; it was here the farmers so often make a mistake. For table purposes the Indian Game, Dorking, and Langshan, or crosses of these, were best. He did not consider it possible for them to produce a fowl that combined in any great degree both laying qualities and table birds. Members were generally of opinion that the common fowls were most suitable for this district, as breeds of prize poultry require too much attention. Mr. Ward stated that he had kept an account of all the wheat fed to his fowls last year, and found that the return was equal to 21s. per bag.

FERTILISERS FOR WHEAT.—Mr. Pike reported having applied Thomas phosphate at rate of 200lbs. per acre to a small plot of Early Show wheat, but through rust and hot winds the sample was spoiled; unmanured land alongside yielded 12bush. per acre. Mr. Brooks dressed plots with 80lbs. and 56lbs. per acre of super., but the land being variable he could not say which did best. He believed, however, that a heavy dressing in this district would produce a growth that would not stand the deficient rainfall of the average season. Members considered 50lbs. per acre of super. sufficient in this district; also that a dry super. gives equally as good results as a moist super., and is much easier to apply.

FALLOW.—Mr. Elleway (visitor) expressed the opinion that farmers would increase the returns considerably if they cropped less land and worked it better; they should go in for more fallowing than was usual.

OATS.—Mr. Ward found that 20lbs. of oats per acre was sufficient to sow.

Boothby, March 4.

Present—Messrs. J. T. Whyte (chair), J. A. Foulds, T. Sims, H. S. Robinson, R. M. B. Whyte, G. T. Way, J. R. Way, A. A. Turnbull (Hon. Sec.), and two visitors.

WATERING HORSES.—Mr. Sims asked when should horses be watered—before or after feeding them? Members were unanimously of opinion that the best time to water stock was before giving them food, the principal reasons being that the horse will eat its food better and was not so liable to get griped if travelled fast or worked heavily immediately afterwards.

Onetree Hill, February 21.

Present—Messrs. J. Bowman (chair), A. Adams, F. Barritt, H. H. Blackham, F. Bowman, G. Bowman, J. Flower, F. L. Ifould, W. Kelly, E. A. Kelly, M. G. Smith, A. Thomas, J. Clucas (Hon. Sec.), Geo. Jeffrey (Wool Instructor), and a number of visitors.

SHEEP FOR FARMERS.—Mr. G. Jeffrey gave a very instructive address on this subject. Fat lambs for market, wool for sale, classing and handling of wool, and care of sheep generally were dealt with. A large number of questions were answered by Mr. Jeffrey, to whom a hearty vote of thanks was accorded.

Reeve's Plains, February 21.

Present—Messrs. W. H. George (chair), J. G. Folland, W. S. Cordon, J. Dawkins, W. Day, H. Day, W. Cawrse, A. Arnold, E. Hancock, Herbert Day, J. McCord (Hon. Sec.), A. Molineux (General Secretary), and a number of visitors.

PICKLING SEED WHEAT.—A long discussion on this subject took place. Mr. Henry Day said there was no general rule amongst farmers as to the strength of pickle or how to pickle. He considered 1lb. bluestone to 12bush. wheat quite strong enough; Professor Lowrie had suggested pickling wheat some months before sowing, but his experience was not favorable to this practice. Mr. Molineux explained life history of so-called "smut" in wheat, and the necessity for putting the pickled wheat into bags that had also been treated to destroy the spores. All bunt balls should be floated off the seed before pickling, as if left in they would get broken in the drill and reinfest.

the seed. Bunt was a distinct plant, which was parasitic on wheat, but which could only be reproduced from its own seed or spores. Mr. Folland had used urine and hot lime, also sulphur, as pickles, with success; if the seed is left too long in the urine its germinating powers are injured. He showed ear of wheat with one side affected by bunt and the other quite free. Mr. Molineux stated this was due to the fact that the bunt plant had only obtained entrance to one side of the young shoot. Mr. Cordon had used $\frac{1}{2}$ lb. of salt and $\frac{1}{2}$ lb. of bluestone to the bag of wheat with satisfactory results. Most of the members used $\frac{1}{2}$ lb. of bluestone to the bag. It was resolved "That in the opinion of this meeting it is more satisfactory to dip the seed and float off the bunt balls than to pickle on the floor."

Mount Compass, March 8.

Present—Messrs. M. Jacobs (chair), F. Slater, R. Peters, D. J. Hutton, H. McKinlay, F. McKinlay, W. Gowling, A. Sweetman, C. E. Good, S. H. Herring, C. S. Hancock, A. J. Hancock (Hon. Sec.), and four visitors.

DETERIORATION OF POTATOES.—Mr. Good initiated a discussion on this subject. Far better crops were obtained from seed from other places than from seed grown locally, and he asked why was this? Mr. Sweetman thought climatic conditions largely responsible; seed obtained from the plains always yielded better than local seed. Mr. Hutton thought too much ingrowing the cause; altogether new blood was required. Mr. H. McKinlay agreed; they continued to grow from the same strain far too long. Mr. Peters mentioned a grower who obtained good crops and had not obtained new seed for twenty-five years; he thought that if the land received a good dressing of stable manure it would yield well. Mr. Slater did not see how there could be such a thing as "ingrowing" with potatoes. The climate and soil had most to do with the results; he had got twice the yield from land that had had a spell compared with land cropped for several years in succession. Members were generally of opinion that the Mount Gambier redskin was the best disease-resistant potato they had grown.

Kapunda, March 8.

Present—Messrs. W. M. Shannon (chair), J. O'Dea, G. Teagle, W. Flavel, R. B. Banyer, J. A. Schultz, Pat Kerin, Peter Kerin, C. E. Weckert, J. Correll, G. Harris (Hon. Sec.), and one visitor.

WHEAT STANDARD.—A long discussion took place on this subject. Mr. Teagle strongly condemned what he considered to be unfair treatment on the part of the Corn Trade Section of the Chamber of Commerce in respect to this matter. Scores of farmers this year had to submit to a reduction of 1d. to 3d. per bushel because their wheat did not reach last year's standard. The standard this year was fixed at 62lbs. late in the season, and wheat weighing this was previously docked by the buyers, who will, however, sell it at full rates and pocket the amount extorted from the farmer. At the present time our standard was the highest of any of the States, but our price was not; yet the farmers were told by the Chamber of Commerce that a high standard was to their advantage. The Chairman did not altogether agree with Mr. Teagle, as a low standard would only induce carelessness in cleaning. It was not the standard that was objected to, but the way it was applied by buyers. The amount docked was irregular and no encouragement was given to farmers to do more than bring the wheat up to the standard; wheat several pounds over the standard was worth more than wheat barely reaching it and should be paid for.

The only remedy he saw was co-operation; let the farmers combine and protect themselves. Take the price at Port Adelaide and inland; it only cost 2d. per bushel to convey wheat from Kapunda to Port Adelaide, and if, as sometimes was the case, there was a difference of 3d. to 4d. per bushel the farmers should take steps to save themselves from loss. Mr. Schultz had been dealing with shippers of wheat for seven years and had never been docked in price; farmers were largely to blame in not cleaning their wheat properly. Mr. Flavel, while urging the necessity for cleaning the wheat, admitted that under present conditions buyers were actually offering inducements to farmers to bring in wheat that was not cleaned as well as it should be. Mr. D. Moody, a visitor, urged farmers to combine and ship the wheat themselves; they had the Farmers' Union, and if it was properly supported they could soon remedy any injustices of this character. Mr. Correll agreed; he had been a member of the Union for a long while, selling almost all his produce through it, and was always well treated. He got a better price for what he sold and paid less for what he bought than if he transacted his business with private firms. Members generally were favorable to the Union, and it was decided to discuss the matter at next meeting.

Murray Bridge, February 22.

Present—Messrs. B. Edwards (chair), J. Staeker, W. Schubert, H. Schubert, and W. Lehmann (Hon. Sec.).

PRESERVATION OF EGGS.—The Chairman tabled duck eggs which had been preserved in solution of lime, salt, and cream of tartar for seventeen months; the eggs were in first-class condition, those that had been cooked retaining the flavor of fresh-boiled eggs.

FALLOWING.—The Chairman read extract on fallowing and the necessity for summer working of the land. Members consider it impossible to work the fallow in the summer, as if they did the soil would drift to the depth to which it was worked.

TAKEALL.—Mr. Wundersitz considered ploughing or working land not thoroughly moist the main cause of takeall. As far as he could see the season made no difference; the trouble was worst on loose light land, but he could not say what effect rolling or manuring would have. Mr. Lehmann did not think the season had much to do with prevalence of takeall, although a good rain in spring seems to check its spread. It appeared on all fallow land, but was worst on late fallow; on some soils manure seems to check it, but it has no effect on the ashy soil round the limestone ridges. He had the disease very badly on heavy but shallow clay soils. Rolling after the crop is up did not appear to do any good. The "takeall" to which he referred was the disease that affects the wheat in patches during various stages of growth, causing it to die right off; oats, drake, and other weeds growing plentifully. On the lighter scrub land he had noticed silver grass similarly affected at times. Oats would do fairly well on these "takeall" patches.

Mount Gambier, March 8.

Present—Messrs. W. Mitchell (chair), J. C. Ruwoldt, W. Barrows, T. H. Williams, M. C. Wilson, A. J. Wedd, and E. Lewis (Hon. Sec.).

WEIGHTS OF PRODUCE.—Considerable discussion took place in respect to weights of produce forwarded by the railway, there being a movement to secure that the seller of produce be entitled to know the railway weight of produce trucked at Mount Gambier. The matter resolved itself into a question between buyer and seller as to weights of produce purchased.

HORSE SCAB.—Mr. T. H. Williams read the following paper on this subject:—

Horses running on the south-eastern coast of this State have been subject to what has been locally known as "coast scab." The animal may be quite free from the trouble in the evening, but if turned in to pasture where the swamp teatree and cutting grass are plentiful on the following morning the limbs and body will be covered with papulae, varying in size from a split pea to a shilling. There is evidence of a considerable amount of irritation, and the animal bites itself about the legs and body. In a few days well-marked pustules form, from which lymph flows freely; the hair comes away from the cuticle, and a dirty-looking scab is seen. On examining this scab with a magnifying glass a bright red ring will be visible round it. If this is scraped into a bottle containing spirits or other clear fluid, and agitated sufficiently to separate the red mass, it will be found to consist of thousands of minute parasites, very similar in appearance to the scab acari of sheep. Under the microscope, however, it will be found to differ from the parasite of sheep scab, though it is about the same size. In January last the writer inspected horses affected, and was enabled to collect some thousands of this interesting parasite. Good microscopic slides were prepared. Although the "coast scab" of the horse has been known for many years, this is the first time the cause has been determined and the parasite found. The life history of this parasite has not, as far as the writer is aware, been fully studied, but it is probably a vegetable feeding mite, which will attack the horse or man when opportunity offers. It may be well to mention that its attacks are not confined to the horse alone, as many picnic parties have found to their cost. They attack man even more savagely than they do the horse. They burrow into the skin as they do the horse, and the pain and irritation they set up has been described to the writer as maddening, and some who have suffered have sought medical aid. Suppurating sores sometimes form about the legs of horses, owing to the scabs becoming invaded by bacteria. Scabby legs are spoken of as "coast legs." Some owners are of opinion that horses are only subject to one attack a year, generally about December and January. Others think horses running on country where the parasite is become immune, as fresh horses put with them show evidence of the parasite at any time. Working horses that have been attacked have been useless for work for a fortnight or three weeks, after which time the parasite may disappear. The best treatment is to wash the affected animal a few times in fluid carbolic dip.

Some discussion ensued, and it was stated by Mr. Williams that this pest attacked men as well as horses, and members mentioned that it was probably the cause of sundry irritations to which local names had been given. The Chairman mentioned that at Wylie it was very plentiful and annoying to workers.

Colton, March 8.

Present—Messrs. P. P. Kenny (chair), W. J. Packer, Jno. Shipard, M. S. W. Kenny, H. A. Kleeman, G. Mayers, and R. Hull (Hon. Sec.).

TAKEALL.—This subject was further discussed. Mr. Shipard had covered a "takeall" patch with stable manure, but the trouble was worse than ever next year. Mr. M. S. W. Kenny said there was such a thing as giving a hungry man too much to eat; perhaps this accounted for the result mentioned. He thought that takeall was probably due to some deficiency in the subsoil; while the roots were near the surface the wheat apparently thrived, but as they went deeper "takeall" developed.

IMPACTION IN CATTLE.—Members reported this complaint to be prevalent. Mr. Shipard advised members to watch their herds, and if their droppings are found to be dark or discolored, they should give the cows a bran mash and any soft nutritious food. [Give them bonemeal, salt, and sulphate of iron also; if this were given the cattle occasionally impaction would to a considerable extent be avoided.—GEN. SEC.]

SHEEP.—The Hon Secretary stated that sheep in large paddocks were not doing well this year; he believed the cool summer had something to do with it, as the sheep stayed away from the water for long periods. He did not know whether red rust would affect grass as well as wheat, but thought it might to a certain extent, and if so it would partly account for the poor condition of the sheep.

Brinkworth, March 14.

Present—Messrs. A. L. McEwin (chair), J. Cross, A. W. Morrison, H. J. Welke, W. H. Shepherd, J. F. Everett, J. Stott (Hon. Sec.), and one visitor.

WHEAT EXPERIMENTS.—At previous meeting members reported on experiments with wheats received from Central Bureau, some being second year's crop. Mr. Everett reported favorably of Gamma wheat; to grow it again and offer seed next season to Branch. Mr. Ottens sowed 72lbs. Ranjit wheat on one and three-quarter acres sandy clay ground, and reaped 17bush. 15lbs.; he considered it a good wheat. Mr. A. W. Morrison sowed 70lbs. Marshall's Hybrid on May 10, and reaped from two acres, on November 27, 28bush. of wheat. Mr. Auger obtained 11lbs. 1oz. of World's Champion wheat from 100zs. seed; there was scarcely a trace of rust. Seed was sown late and on an inferior piece of land, otherwise results would have been better.

IMPROVEMENT OF BUREAU.—Mr. Grasby's paper was discussed. Members were opposed to proposal to increase membership of Branches, and were satisfied with the present constitution of the Central Bureau.

Port Lincoln, February 21.

Present—Messrs. W. Laidlaw (chair), J. Anderson, R. Puckridge, J. C. Richardson, P. Sullivan, James O'Shanahan, J. D. Bruce, and Dr. E. Kinmont (Hon. Sec.).

FAT LAMB TRADE.—Considerable discussion took place on the advisableness of farmers in this district catering for the Adelaide market for fat lambs. Members were of opinion that it would be profitable to raise fat lambs, the Shropshire-Merino cross being favored; and the Hon. Secretary was requested to obtain all the particulars he could in regard to facilities for the development of the trade from Port Lincoln district.

Mount Remarkable, February 20.

Present—Messrs. C. E. Jorgensen (chair), W. Lange, J. B. Morrell, T. P. Yates, W. Foot, J. McIntosh, and J. O'Connell (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary's report showed that during the year twelve meetings had been held, with an average attendance of 8.4 members. In addition to three practical papers, numerous other matters from the *Journal of Agriculture* and elsewhere had been discussed, and generally the meetings had been instructive. The retiring officers were re-elected and thanked for their services.

Millicent, March 6.

Present—Messrs. H. F. L. Holzgreffe (chair), H. A. Stewart, H. Hart, B. Varcoe, J. Davidson, H. Oberlander, R. Campbell, A. McCrostie, S. J. Stuckey, and E. J. Harris (Hon. Sec.).

BUSINESS.—Mr. Davidson was advised to plant buffalo grass to bind the loose sand. Some members advised sowing Yorkshire foggrass. Mr. Holzgreffe reported favorably of Marshall's No. 3 wheat; it was a week earlier than Tuscan, freer from rust than other varieties grown, and produced a good grain. The Hon. Secretary advised protecting grapes from birds by means of muslin bags, and Mr. Hart advocated "Union" paper bags, as they also kept off the rain. Two members reported having seen starlings in the neighborhood. Mr.

Varcoe tabled young plants of common bamboo grown from pieces of roots buried in the soil. Mr. Davidson called attention to action of Railway Department in increasing freight on cheese, which action was adversely commented on by the members. Mr. Varcoe showed egg-shaped yellow tomatoes, which he found freer from disease than the red kinds, also more suitable for jams, though not so good for sauce.

SUGGESTIONS FOR IMPROVING BUREAU.—Mr. Grasby's paper was discussed. His suggestions *re* membership of Central Bureau were generally approved, but members should be elected at the annual congress in Adelaide. The suggestions *re* membership of Branches were considered too complicated, and the present membership of fifteen was considered sufficient. The idea of reading and lecture course, circulating libraries, science classes, and special bulletins met with approval.

Golden Grove, February 21.

Present—Messrs. R. Smith (chair), J. R. Smart, J. Ross, A. Harper, W. Mountstephen, F. Buder, T. G. McPharlin, S. A. Milne, W. Bartle, A. Robertson, and J. R. Coles (Hon. Sec.).

TAKEALL.—Mr. McPharlin reported that he found this worse in wet season; it was worst on late fallow and on loose light soil. Rolling after sowing had no effect, nor did manuring. Last year he noticed myriads of small flies on some of the patches; dressing the patches with sulphate of ammonia had a good effect, but it was expensive. On land worked when wet, and a solid seedbed secured, takeall was not so bad. Mr. Smith found season and manner of working soil made no difference to prevalence of takeall. All classes of land seemed equally liable, and manuring had no beneficial effect. The disease appears the first year in small patches, which increase in size each year. Oats on these patches were not affected, but it showed again in succeeding wheat crops.

BROADCASTING V. DRILLING SUPER.—This subject was discussed at some length, but no decision as to which practice was best was arrived at.

EXHIBITS.—Mr. Buder tabled splendid samples of pears, including Durondeau, Beurre de Capiaumont, and Beurre de Arensberg; also Jonathan apple of good quality.

Ardrossan, March 1.

Present—Messrs. G. Freeman (chair), R. Dinham, S. Alderman, J. Cornish, C. Dinham, J. Henderson, W. Lodge, D. Wilson, and N. Opie (Hon. Sec.).

STEAM THRESHER.—Correspondence in connection with proposal to purchase a steam threshing plant for use in the district was dealt with. Members were unanimously of opinion that such a plant would be of great benefit to the farmers, and after discussion on ways and means it was decided to call a public meeting of farmers to devise a scheme for securing the plant.

Swan Reach, March 7.

Present—Messrs. P. A. Hasse (chair), L. Fidge, W. Hecker, F. Brecht, R. J. Harris, F. Fisher, E. Mieke, and J. L. Baker (Hon. Sec.).

FERTILISERS.—Mr. Brecht condemned chemical fertilisers; he knew a farmer who applied 25lbs. per acre of super. and got good returns. The next year he applied 50lbs. to the same land with less result; each year he increased the dressings, and the sixth year he put on 150lbs. per acre and got no better result.

than the first year. [Because a farmer is guilty of bad farming practice, it is no proof that the fertiliser is to blame. Too many farmers look to the fertiliser to make good defects in the method of cultivation. The farmer that expects to get six crops of wheat in successive years off land in a dry district must expect to fail.—GEN. SEC.] Mr. Brecht preferred farmyard manure; he believed every farmer should put all stable manure and rubbish that would decay into a pit and rot it thoroughly; they would have a better manure than any they could buy. Members agreed that it was best to put in the seed with the drill on new land or sandy soil in this district, as it was protected from the birds and was not so likely to be uncovered by the wind.

Cherry Gardens, March 4.

Present—Messrs. W. B. Burpee (chair), T. Jacobs, C. Lewis, J. Lewis, G. Hicks, T. Paltridge, J. Metcalf, A. Broadbent, G. Brumby, H. Strange, and C. Ricks (Hon. Sec.).

APHIS.—Mr. Paltridge wished to know best remedy for peach aphis, and was advised to try tobacco water, but said this had not proved a success. Mr. Strange was advised to use soapy water for cabbage aphis. [Tobacco water properly applied is about the best remedy for peach aphis. It requires to be made with soapy water, as it is then more effective. The soil round the roots should be removed before the trees show any sign of growth, and strong tobacco water poured round the stem. As soon as any sign of insects are seen on the branches, spray thoroughly with tobacco water and repeat at intervals of three or four days. Tobacco water will also prove effective on cabbage aphis when the plants are young.—GEN. SEC.]

Crystal Brook, February 22.

Present—Messrs. J. C. Symons (chair), A. Hamlyn, R. Pavy, D. Pavy, G. Davidson, W. J. Venning, and F. S. Keen (Hon. Sec.).

QUANTITY OF SEED PER ACRE.—Mr. Symons read some extracts from the *West Australian Mail* of June 29th, 1901, "Hints to Farmers," and dealing with this subject:—

This is an important question, and has led to most acrimonious discussions by the advocates of light and heavy seeding. In the United Kingdom, about ten years ago, the advocates of thin seeding were numerous, and the agricultural papers were full of the important discovery. Ten pounds of seed per acre were more than ample according to them. In this State, about three years since, some of the farmers had evidently fallen in with some of the agricultural papers with articles on this question, and for one season the papers were full of the wonderful saving that was to take place in seed, and the extra heavy crops that were to be obtained. Harvest came round on the 10lbs. per acre paddock, and then—silence—so profound it has never been broken since. This thin seeding fad here, as well as elsewhere, is a thing of the past, but the amount of seed that should be sown still remains an important and very debatable question. It is a many-sided question and cannot be settled by any definite statement, as the answer depends upon a variety of conditions, some of which tend to neutralise or modify each other. The quantity of seed has a direct bearing upon the expenditure, and therefore upon the profit, and this introduces another phase of the question. We may have been considering the question from a scientific or agricultural point, but are suddenly pulled up by the profit and loss side of the question. The difficulty of the case consists of balancing the various considerations so as to arrive at a just and economical conclusion. Take wheat for example. The advocates of the extremely thin sowing at one time went so far as to recommend 10lbs. of seed per acre, and a few even less. It was argued that, arithmetically, there was an abundance of seeds in 10lbs. to sow an acre, and that sowing more was simply overcrowding the plants. As is commonly the case this new doctrine was received with a good deal of stolidity and indifference, or by a "know better" smile of the farmers, and seeding continued on the old lines. It is probable that the attention drawn to thin seeding

was not profitless, but has resulted in the general use of more moderate quantities, especially since the introduction of the drill. With the seed drill, probably the average quantity of wheat sown per acre is about a bushel, but, as before stated, no hard and fast line can be laid down, as the conditions of soil, climate, and time of year have all to be taken into account. It is very much a question of growth, both above and below ground. Every farmer knows what wheat is capable of in the way of tillering out if it has plenty of space around it. The amount of seed will to a certain extent depend upon the quality of the land. Good rich land will produce a heavy crop from thin sowing, while the same quantity of seed in poor land would give no crop worth cutting. Some who have not thought out the question have an idea that poor land ought to have a thin sowing, as it could not support a good crop. At first sight this seems right enough, but a little thought will show that it is not. Good land is able to support and induce tillering, while poor land is not, and hence the necessity of having the seed close together. On good land the tillering qualities of wheat are extraordinary; as many as 107 separate seed stalks have been found on a single plant, while on poor land this property may be said to scarcely exist at all. It is nothing uncommon on poor land to see a single stalk only from each seed. Another very important factor which ought to regulate the quantity of seed sown is the time of year that sowing is done. If wheat were sown at the end of April or early in May, 40lbs. might give as good a return as 80lbs. sown in June, or 120lbs. sown in July, in the eastern districts. In writing this I am not taking into account the south-west district, which is much later, and cannot be called a wheat-growing district. It may be taken as an axiom that the earlier the sowing takes place the less seed is required, and that double, or even three times the amount of seed will be required late in the season, compared to what is necessary if sown early. As a general rule it may be taken that 40lbs. of the good seed drilled in on average land will be sufficient if sown in April, 60lbs. in May, 80lbs. in June, and at least 120lbs. in July. If sown broadcast at least half as much more than these quantities should be used.

[The writer apparently is unaware of the fact that the advocates of this light seeding made it contingent on thorough preparation, including manuring, of the land, the sowing of the seed at equal distances apart, and cultivation between the rows during growth. In the February issue of *Journal of Agriculture*, page 630, is report by Mr. F. Coleman, of Saddleworth Branch, who sowed at the rate of 7½lbs. per acre and reaped up to 30bush. per acre.—GEN. SEC.] Mr. Venning does not agree that the early sowing requires less seed, as some seed must be allowed for malting. Mr. Pavy thinks paper is not correct, as the varieties of wheat differ so, some stooling so much more than others. In his opinion 45lbs. is ample. Mr. A. Hamlyn stated he has known in the South-East ½bush. to be ample. Members all think that the stripper is responsible for a lot of the seed not germinating. In the earlier days farmers objected to using wheat for seed that had been taken off with the stripper.

Clare, March 14.

Present—Messrs. W. Kelly (chair), J. Treleaven, J. Christison, R. Martin, J. McCarthy, A. P. Birks, C. Horsman, and W. S. Birks (Hon. Sec.).

CODLIN MOTH.—Discussion on various horticultural subjects took place. The spraying of apple-trees for the suppression of codlin moth was considered, and the opinion expressed that the pest could be kept in check if the growers would all take the matter in hand, but if it were once allowed to get a hold in the district it would be a difficult task to deal with. Mr. Treleaven tabled fine samples of Winter Majetin apple and Messrs. Birks Bros. samples of Salwey peaches.

Penola, March 8.

Present—Messrs. W. Miller (chair), E. A. Stoney, L. W. Peake, W. P. Davis H. Richardson, J. W. H. Sandiford, H. Morris, F. F. McBain, and F. Ockley (Hon. Sec.).

SPARROWS.—The clerk of the local district council intimated that £5 had been voted for payment for sparrow destruction.

MAIZE.—The Chairman exhibited specimens of maize, illustrating the difference in growth where seed was ploughed in to 6in. deep and where it was sown on the furrow and harrowed in. The specimen from the former was tall, green, and bright, while from the latter it was short, quite dry, and shrivelled.

CLEARING TIMBER.—Discussion took place on the clearing of timber, it being generally agreed that the thorough eradication of all roots and stumps was desirable, especially where fruit trees or vines are to be planted, as the decaying roots were likely to communicate dry rot to them.

Port Germein, February 22.

Present—Messrs. G. Stone (chair), E. G. Blesing, P. Hillam, W. Head, W. Mortess, Thos. Smith, J. K. Deer, W. Holman, D. Thomson, C. O'Loughlin, H. Kingcome, A. H. Thomas (Hon. Sec.), and one visitor.

CRYSTAL BROOK CONFERENCE.—The Chairman reported on proceedings of Conference. He was not in favor of Mr. Goode's proposal for a permanent standard for wheat, as it was not practicable and could not give satisfaction.

MARRAM GRASS.—It was decided to make inquiries as to advisableness of planting this grass on the sandhills, which in some parts are drifting to such an extent as to make the roads impassable. [Marram grass is particularly fitted for binding seacoast sands, but will thrive inland. It should only be planted on waste lands. Read February, 1902, and previous issues of *Journal of Agriculture* for full particulars.—GEN. SEC.]

CATTLE COMPLAINT.—Mr. Blesing reported loss of cattle from some disease. The animals showed outward signs of impaction, but on being opened after death indications of impaction were absent. The animals did not appear to be able to swallow their food, as it all came back into their mouths, and they are unable to get up. Mr. Head made a *post mortem* of two of the animals. The omasum or bible was filled with hard, tough substances; the stomach was full of fluid, which appeared to have caused inflammation. He did not think impaction the cause of death.

Meningie, March 17.

Present—Messrs. M. Jinn (chair), T. W. R. Hiscock, W. J. Botten, H. May, R. M. Scott, S. F. Robinson, W. Wilks, and H. B. Hacket (Hon. Sec.).

EXHIBITS.—Mr. May tabled splendid samples of Sweetwater, Doradilla, and Crystal grapes; he had bunches weighing from 5lbs. to 8lbs. each.

STOCK COMPLAINTS.—Mr. Hiscock tabled bones of a horse that had died. It received an injury to the forefoot several years ago and became lame. It was worked as usual, and on death it was found that the whole of the bones from the fetlock joint to the sole of the foot had grown together. The Hon. Secretary read the following letter from Stock Inspector Williams:—

IMPACTION, OR DRY BIBLE.

In my opinion most of the cases are impaction. The case on which you saw a *post mortem* was undoubtedly so, as the cakes of ingesta had been arrested in the omasum a considerable time to be blackened in the way you mention. Many cases of this complaint are occurring among cattle in this district just now, and I am having many *post mortems*. I find when a beast has been dead some hours before the *post mortem*, that the action of decomposition has sometimes softened the contents of the omasum, and one would be inclined to think there had not been any impaction, but a careful examination with a glass will generally reveal the fact that the leaves of the omasum are not normal, as they show evidence of inflammation and pressure, and fragments of the dry cakes of ingesta are frequently found in the abomasum and intestines. The large paunch (the rumen) is frequently impacted with a mass of hard fibrous

ingesta which has been gathered by the animal in the course of browsing, and once swallowed cannot be returned to the mouth to be cudded. With either of these forms of impaction the animal rapidly weakens and is soon beyond treatment. There is another complaint that may frequently end with impaction of one or both stomachs. I refer to a condition brought on through cattle eating plants possessing diuretic properties. The action of the kidneys is stimulated for a time and an abnormal flow of urine results. In a short time the neck of the bladder becomes inflamed and thickened, and paralysis of the organs of urination takes place. The affected beast soon loses power of the hind quarters and is unable to rise. In a short time the bladder becomes distended with urine, and may burst if a catheter is not used. Impaction of one or both stomachs may rapidly follow the urine trouble. The most likely plant to cause the urine trouble is the yacca, when the shoots are newly sprouting after burning. Other plants no doubt possess the same diuretic properties. Filthy stagnant water may cause kidney and bladder disease, and is also the frequent cause of acute impaction of the stomach. When water becomes filthy—contaminated by animal excretions—as many dugout waterholes are, unfortunately, animals will not drink enough to mollify the dry hard food they are forced to eat at the present time of the year. The result is rapid impaction of the stomachs. If a case of impaction is taken in the early stage, the following may cure the affected animal:—1lb. of salts, a quart of molasses, and 3galls. of water as hot as may safely be given. Feed the beast on bran mashes with a little salt, sulphate of iron, and bonemeal added. Should a beast be relieved of the impaction, it will be wise to continue feeding on steamed chaff, bran, &c., otherwise the complaint will soon recur; it is generally the case that a beast cured this year will develop the trouble next if great care is not taken. The wisest course for owners to follow in localities where impaction is prevalent is to try and prevent the trouble, and this can only be done by proper feeding. There must be nourishing properties, or nature will break down. Hay, straw, or grass stacks should have molasses put into them when being built—at the rate of 1 ton of molasses to 40 tons of hay. Salt and sulphate of iron may also be put into the stack or given to stock through their water. Bonemeal is being given with good results; about ½pt. a day may be given with feed.

Mr. Hiscock referred to term "gall stones," commonly applied to stones taken from the kidney or bladder. This was an incorrect description, as they were properly gravel stones, gall stones being altogether different. Members were of opinion that the term gall stones was generally used without implying that they came from the gall. Mr. Hiscock read extract describing the stomach of the cow.

Port Elliot, March 15.

Present—Messrs. J. McLeod (chair), W. E. Hargreaves, H. Pannell, R. E. Ulrich, F. Basham, C. Gosden, J. Nosworthy, E. Hill, H. Green, H. Welch, and J. Brown (Hon. Sec.).

BUSINESS.—A ballot was taken to fix dates of meetings when individual members shall read papers or initiate discussions.

CENSURE ON GEN. SEC.—Mr. Ulrich moved and Mr. Gosden seconded "That Mr. Hargreaves bring before the Strathalbyn Conference the unfair treatment received by this Branch at the hands of the General Secretary *re* papers read." [The Strathalbyn Conference having been abandoned this year, on account of the apathy shown by the various Branches concerned, the General Secretary must await his sentence for another year. If the editor of the departmental *Journal* had unlimited capital at command he could save censure and worry by printing everything that is said, done, and written at Branch meetings.—GEN. SEC.]

Finniss, March 3.

Present—Messrs. J. C. Chibnall (chair), A. Green, T. Collett, and S. Collett (Hon. Sec.).

SHRIVELLED SEED.—Discussion on cause of shrivelled grain in wheat took place, members being of opinion that rust was not wholly the cause, as heavy rain at flowering and excessive heat afterwards will cause shrivelled grain. Some wheats free from rust produced inferior grain.

Mount Bryan East, February 22.

Present—Messrs. A. Pohlner (chair), W. H. Quinn, G. Taylor, B. H. K. Dunstan, J. Honan (Hon. Sec.), and two visitors.

CASTRATING COLTS.—Mr. A. Pohlner read a paper to the following effect:—

There are some owners of colts who are desirous to receive instruction upon this operation, but there are many who think they know all about it. When about to operate, two, or better still, three assistants are required. Rope the colt, put on the ordinary rope collar. Put a backband of rope around the colt; bring the ropes from the neck, back, and around the fetlocks and under the backband. The backband prevents the collar slipping along the colt's neck, also prevents him knocking his head about. The proper age to castrate is at two years old, and the animal should be in low condition. The best month is in November. Use plenty of lard rubbed into the scrotum or purse after the operation—olive oil is also a good thing for the same purpose—to keep away flies. Use resin for the searing. Be extremely careful not to cut through the inner lining of the purse. The operation should never occupy longer than ten minutes from the time the colt is down.

Mr. Quinn bore testimony that Mr. Pohlner had treated all of his colts during twenty years, and not one had been lost.

EXHIBIT.—Mr. Bryce tabled very fine watermelons grown without any watering.

Stansbury, March 1.

Present—Messrs. A. Anderson (chair), P. Anderson, C. Faulkner, F. Faulkner, H. C. Pitt, G. Jones, G. Brundle, P. Cornish (Hon. Sec.), and one visitor.

WOOL-CLASSING.—It was decided to ask Mr. George Jeffrey if he could start a class in this district as soon as seeding is over, members being of opinion that a strong class would be formed if the time fixed is convenient.

CODLIN MOTH.—Mr. Pitt reported having taken steps to prevent codlin moth-infested apples being sent to this district. Mr. Faulkner found his garden was slightly infested, so he removed all the fruit soon after it had set, in order to destroy the caterpillars.

WHEAT EXPERIMENTS.—Mr. Faulkner reported Majestic wheat yielded well, resisted rust, and was a very promising variety. Silver King also yielded well. The Hon. Secretary reported on wheat sown on June 4, on mallee land, treated with 1cwt. guano super. per acre. Gamma, very nice wheat, rust-resistant, yielding 19½lbs. for each 1lb. sown. World's Champion, a good wheat, slightly rusty; yield, 18lbs. to 1lb. Club-head, rusty; yield, 15lbs. to 1lb. The Hon. Secretary also tabled three samples of wheat from seed sown on October 17. He had received a sample of Wallaroo super., and, wishing to test its quality, he sowed three drills with Dart's Imperial wheat, treating one with Wallaroo super., one with Lawes super., and one was unmanured. There was no difference between the manured plots, which were stated by a member to have looked equal to 8bush. to 12bush. per acre. The unmanured drill was very inferior. Considering the lateness of seeding, the wheat stood well. Members were considerably interested in the experiment.

Strathalbyn, March 17.

Present—Messrs. M. Rankine (chair), D. Gooch, W. M. Rankine, P. Cockburn, H. H. Butler, G. J. Reid, W. J. Tucker, J. H. W. Mules, P. McAnaney, G. Sissons, J. Cheriton (Hon. Sec.), and one visitor.

SOUTHERN CONFERENCE.—Owing to the want of interest shown by the surrounding Branches, and to the fact that the general election campaign would be in full swing, it was decided to abandon the Conference for this year.

DATE OF MEETINGS.—Members disagreed with the General Secretary in respect to publication of dates of meetings of Branches in the *Journal*, they being of opinion that most favorable results will accrue from its adoption. Next meeting to be held on April 21.

SEEDING.—Mr. Cheriton read a paper on this subject to the following effect :—

This is a question that every cultivator of the soil is very deeply interested in, and as seedtime is now soon to commence in this district, it is opportune to discuss the important subject. The time has long since passed when merely ploughing and harrowing in the seed is all that is required to secure a crop, and it has been forced on us to adopt more up-to-date farming by fallowing, cultivating, manuring, and drilling in our crops. I consider it is most desirable that our farmers, whether on large or small farms, to have at least one half of the land they intend to crop fallowed as early in the winter as possible and well worked on the surface to the depth of two to three inches, all weeds being kept down so as to conserve the moisture for the future crop, as if they are allowed to grow they extract the moisture that it is so necessary to retain in the soil, and neutralise to a very great extent the good effects of fallowing. Professor Lowrie went very fully into the question of early fallowing at the Congress held in Adelaide last October, and brought forward some startling ideas in connection therewith, and I would advise our farmers to study his remarks as contained in the *October Journal*, pages 250—251. As to the stubble land that you crop, the straw should be cut as soon as possible after the stripper has done its work, and stacked in some convenient place where the stock could get to it, and no doubt they would eat a good deal of it, and the stacks would be a good breakwind and shelter to the stock. What was not eaten would be trodden and made into manure. The chaff should be carted into a shed and taken care of, as it would be valuable for fodder during the winter. After the straw is cleared off the land a heavy harrow or scarifier should be run over it, so that the rain when it falls would be prevented from running into hollows, and cause some of the land to be too wet and other parts quite dry. If the land is lumpy put the roller over it and pulverise the clods, as if this is not done they would be ploughed under the furrow and keep the land hollow, and not favorable to the growth of a crop. As to fallowing light sandy soil, I am of opinion that no good results would accrue, but would be a nuisance in many ways by blowing about in all directions and doing much damage. Very sandy land should not on any consideration be cropped more than two years in succession. Having the land ready for the crop, I would prefer that the seed be drilled in with the manure. The hoe drill is the best for clean clear land free from obstructions, as it gives a better seedbed than the disc; but no doubt the latter is far preferable where there are weeds, straw, or any rubbish that would choke the hoe. The land should be well cultivated before the grain is drilled in, and soon as possible after be harrowed with light harrows. I would impress on all farmers the desirability of planting only the very best seed obtainable; it should be thoroughly cleaned, and all bruised and imperfect grains either screened or blown out. Time can be saved if farmers at harvest time are careful to strip the wheat required for seed as soon as ripe, and not strip in the heat of the day when the grain is easily broken or bruised. We cannot expect a strong and vigorous plant from imperfect seed. I believe that by careful selection our wheats can be much improved.

Members generally agreed with the paper.

Denmark, February 20.

Present—Messrs. E. Taylor (chair), W. Moffatt, J. A. Forde, M. Chapman, W. Waters, F. Turner, C. H. Rose, R. Mulhall, C. Millar, R. Kelly, H. Swiney, F. Cole (Hon. Sec.), and one visitor.

LEMON CULTURE.—Mr. F. Turner read a paper to the following effect :—

After giving particulars of the original habitat of the lemon, and its introduction to cultivation in Italy, Spain, Portugal, California, Florida, &c., he proceeded to say that the lemon is more delicate than the orange, and requires a mean annual temperature of 62° F. He then described the habit of growth of the lemon tree, also its leaves, flowers, and fruits. In the south of Europe lemons are gathered nearly all the year through; but in Sicily the chief harvest is between end of October and end of December, the first gathered being considered the best for keeping. The fruit is picked green, the finest packed in cases, about 420 in a case, each fruit separately wrapped in paper. The rest are used for manufacture of oil and juice. Export continues until May. The large lemons seen in London about July are grown at Sorrento, and are picked when ripe. Candied peel is made in England from larger lemons

grown in Sicily on higher ground. Ordinary lemons contain about 20zs. juice of specific gravity 1·039 to 1·046 with an average of 32·6gram. to 42·53gram. of citric acid per ounce. The amount of acid decreases as the fruit ripens, until scarcely any is present. One recipe for preserving lemon juice recommends that the juice be allowed to settle, then filter through paper. Another advises filling clean bottles with the juice, heat to 150° F., then seal at once whilst the bottles are quite full. Another suggests the addition of 10 per cent. of alcohol. The most simple is to put the juice in a clean glass vessel, put in some olive oil, and draw off as required through a glass tube or tap. The tree does well under the influence of sea air when the temperature is neither very cold nor excessively hot and dry for a lengthened period. Whilst it will grow on almost any soil if properly drained, it does best on a sandy loam. Trees should be budded on orange stocks. The great danger of the lemon stock is collar-rot. On lemon stocks the trees make less growth than on orange stock, produce more fruit, but do not seem to last more than eight years. Perhaps this may be due to excess of high and low temperatures and to the roots reaching salt strata. He then quoted from a paper read by J. W. Freeman, on pruning, who recommended that the branches should be cut back freely to cause twiggy short growths on which the fruit will be formed. Much of the fruit grown at Renmark must be picked before it reaches the proper size, in order to prevent deterioration in quality; or again, it is either too early or too late for market. Although the trees bear all the year, yet by reducing the bearing surface of the tree it may be compelled to bear fruit during summer. The so-called summer crop is on the trees during winter, and if it passes through safely, is just what is desired. Until some method of protection from frost can be devised, the best course will be to hasten the maturity of the winter crop to catch as much as possible of the early market, and hold the balance till spring. This fruit is of much better quality than the summer crop. In cutting back, each limb should be reduced to within 6in. or 8in. of the fork. When branches start from these stumps they should be thinned out to two or three, cutting the rest right out. It may be necessary to reduce the surface still further each year, so that each limb shall not carry more fruit than it can mature. He could show trees treated in this way that were now a mass of blossom right to the centre, and it by no means involved the loss of a year's crop. To get the best result this plan must be continued and all useless growth removed. The grove that yielded the best returns in this section was pruned in this way. An Italian has lately shown that it is advisable to cut out every limb that grows up straight, and he puts weights on side branches to bring them down to a horizontal position. Professor Hilgard says that basic slag (Thomas phosphate) is preferable to superphosphate for supplying phosphoric acid to the soil. Neither nitrate of soda nor sulphate of ammonia should be used, because rain or irrigation would leach it away from the roots. Nitrogen should be supplied either by tankage or green manure crops, the latter being preferable.

Clarendon, March 17.

Present—Messrs. J. Piggott (chair), A. Harper, J. P. Juers, E. Dunmill, J. Pelling, J. Chapman, J. Wright, A. A. Harper, and W. A. Morphett.

GENERAL NUISANCES.—Mr. Dunmill read a paper on this subject to the following effect:—

He did not intend to deal with all nuisances they had to contend with, but a few that are general. He would refer first to the sparrows. Some time ago a member wished magpies to be brought under the operations of the Act as well as sparrows. Now he would sooner put up with six magpies than one sparrow. The magpies on the whole were beneficial. True they occasionally did some damage, but this was a sign of a bad season for them, and also it was due to the fact that the sparrows take a great deal that the magpies would otherwise have to live on. The sparrow was always with them and always troublesome. They worry the crops while they are growing, help to reap them before you are ready, and carry their work to the stack of hay if they get a chance. If the Sparrow Destruction Act were put in force, there would soon be a considerable diminution in their numbers; but, as a matter of fact, practically nothing is done. The starlings he had not much experience of, and, from what he heard of them, he hoped he never would. If magpies were encouraged about the place they would probably do a little mischief now and then, but they would keep away the sparrows and starlings. Then there were the rabbits. Some inexpensive way of getting rid of them would be a great boon. The codlin moth was another nuisance, and the prohibition of the sale of infested fruit was a still greater nuisance. There was little doubt that if every grower attended to the matter properly there would be considerably less loss from the codlin moth caterpillars. Cheap markets were another trouble. Probably this was partly due to everyone trying to buy in the cheapest market. It stands to reason that if everyone buys cheap he must also sell cheap. The same of course applies to labor. In the unemployed question they had another nuisance. Straying cattle can be added to the list; although not troublesome in the day time, they were a serious nuisance at night. The district council was largely responsible for this trouble. They had the power to put a stop to it, but did not exercise it.

Riverton, February 22.

Present—Messrs. W. Hannaford (chair), T. Gravestock, A. J. Davis, E. Kelly, M. Badman, D. Kirk, W. B. Davis, and H. A. Hussey (Hon. Sec.).

CARE AND FEEDING OF STOCK.—The Chairman initiated a discussion on this subject. Only the best of its kind should be kept, and breed only from the best constitutioned of these. A good beast costs no more to feed than a poor one, and gives much better results. Many farmers keep too much stock; they would find it better to keep fewer and look after them better. Young stock must have generous feed when young, or the bone and muscle will suffer. Good pure water was another necessary; stock cannot do well on impure or dirty dam water. Shelter from extremes of heat and cold was also important. Where dam water is used, salt should be provided in the manger or some place where stock can get at it. The Hon. Secretary supported; upon proper feeding and care of the stock very much of the success of the farmer depends. Hay too new and green, or unduly heated or overfermented was injurious. Hay two years old or more was also injurious. Feeding should be modified according to climate, natural herbage, condition of health, and nature of work stock have to perform. Care and attention and proper housing will save many pounds every year. An excellent mixture for feeding horses was two parts clean well-cut straw mixed with one part bruised oats, not ground oats. Turnips, parsnips, carrots, &c., cooked were valuable as a change. Care should be taken not to allow the horse to become poor, as it takes far more feed to bring him back to good condition than it would to keep him in good condition. In his opinion it was a mistake to feed wheaten hay. The horses bolted the heads first, and anyone examining the droppings will find that much of the grain has passed through undigested. If the hay were headed and fed to the animals, and the grain crushed and fed in the chaff, there would be none of this loss. Green feed was generally more profitable than dry, as was moistened or softened feed. Boiling or steaming was the best means of increasing the usefulness of dry food; hay must, however, be free from dust. Considerable discussion took place, it being generally agreed that it was best to keep a few good stock on the farm. Some favored damping chaff for horses, but others thought that unless it was perfectly free from dust it was likely to be injurious. All were agreed that for milch cows the chaff should be damped.

Naracoorte, March 8.

Present—Messrs. S. Schinckel (chair), E. R. Peake, J. G. Forster, J. Wynes, H. Buck, G. Wardle, J. B. Bennett, A. Caldwell, W. McKay, F. Welcome, A. Johnstone (Hon. Sec.), and two visitors.

BOTFLY.—Mr. Peake read a lengthy paper on the Botfly. He said there was a disposition to raise something of a scare amongst horse owners, owing to the alleged heavy mortality arising from the presence of bots in the stomach of the horse. In the western districts of Victoria numbers of deaths of horses had been attributed to bots because on being opened bots were found in the stomach, but he noticed that the local Inspector of Stock, on making a careful *post mortem*, found that the real cause in these cases was a disease of a pulmonary character. The possibility that other reputed cases of death from bots might be due to some definite complaints caused him to look up a number of standard works on "Horses and their Diseases." He found that, as a rule, the best authorities attach little importance to the presence of this parasite beyond stating that at times local irritation and annoyance occurs, but nothing to cause the horse to fall off in condition, much less to cause death. "Youatt, on the Horse," after describing the life history of the bot, says:—"The bots cannot,

while they inhabit the stomach of a horse, give the animal any pain, for they are fastened on the cuticular, or insensible coat. They cannot stimulate the stomach or increase its digestive power, for they are not on the digestive portion of the stomach. They cannot be injurious to the horse, for he enjoys perfect health when the cuticular part of the stomach is filled with them, and their presence is not suspected until they appear at the anus. They cannot be removed by medicine, because they are not in the portion of the stomach to which medicine is usually conveyed, and if they were, their mouths are too deeply buried in the mucus for any medicine that can safely be administered to affect them." Other writers also lay stress on the fact that, at any rate, the bots do little harm, unless the animal is suffering from disease or want of sufficient and suitable food. Mr. Peake said he thought these authorities were sufficient to relieve any serious fears amongst horse owners, but, at the same time, as the botfly is likely to cause annoyance and irritation to horses, its advent was to be regretted, and owners should take the simple precautions necessary to prevent, or, at any rate, mitigate its attacks. A vote of thanks was accorded to Mr. Peake for his interesting paper, and it was decided to discuss it at the following meeting. Mr. Johnstone tabled specimen of tansy plant, a decoction of which was alleged to be a cure for bots in horses.

IMPACTION.—Mr. Wardle reported that having one of his cows very bad with impaction, he came to the conclusion that unless he adopted drastic remedies he would lose her. He gave her two doses of gunpowder, whiting, and sulphur mixed in vinegar, and drenched her two or three times a day with boiled linseed; the third day he gave her another dose, and drenched her occasionally with linseed for a fortnight. She recovered all right, though very weak and poor. At first she went off her milk, but the flow was now all right.

ROPE-TYING.—Mr. Buck gave a very interesting exhibition of tying various useful knots in ropes, which was much appreciated.

Lipson, February 22.

Present—Messrs. Geo. Provis (chair), H. Brougham, C. Provis, S. F. Potter, Caleb Provis, W. F. Darling, R. Haldane, Geo. Carr, Jas. Brown, J. P. Barraud (Hon. Sec.), and one visitor.

RUST.—Discussion took place on rust-resistant wheats. These varieties have not been grown in this district to any extent yet, Early Para being the kind that has suffered least of the numerous varieties grown here.

MILD-CURE BACON.—Mr. Geo. Provis wished to know what constituted the so-called "mild-cure" bacon. [Bacon cured in a very cold temperature, with less salt than usual, and smoked in a cold room—GEN. SEC.]

Crystal Brook, March 22.

Present—Messrs. J. C. Symons (chair), W. Morrish, A. Hamlyn, G. Davidson, W. J. Venning, P. Pavy, R. Pavy, and F. S. Keen (Hon. Sec.).

MANURE EXPERIMENTS.—Mr. R. Pavy sowed Dart's Imperial wheat on dirty fallow with 60lbs. superphosphate, and another lot with 120lbs. super., leaving some part unmanured. On clean fallow he sowed Gluyas wheat with 60lbs. and 120lbs. respectively of super., leaving some land unmanured. The manured portions were quite a fortnight earlier than the unmanured. The unmanured portion of Dart's Imperial was worthless; but the heavier-manured plots did not appear to give better results than where only 60lbs. had been used—certainly not enough to pay for the extra cost. Mr. A. Hamlyn sowed 40lbs.,

60lbs., 80lbs., 100lbs., superphosphate with Gluyas wheat, and the difference in yield was hardly noticeable; but where no manure was used there was no crop at all. Members agreed that very little will be gained by exceeding 45lbs. super. per acre. Cases were cited where phosphatic manures have been used for seventeen years and the land is as good as ever.

FARM LABOR.—Mr. G. Davidson read a paper on "The Farm Labor Problem." to the following effect:—

This question will have to be seriously considered if a blow to the producing interests is to be avoided. From one end of the State to the other farmers and dairymen are raising their voices against legislation which directly tends to curtail production by raising wages and shortening the hours of labor. The Minimum Wage and Factories Acts are denounced on all sides, and employers generally are feeling not merely unrest, but downright alarm in regard to the future. Enterprise is crippled, because those who have money are afraid to invest it in improvements, or divert it into channels which would create new sources of employment. They fear that a fair return for the investment may become impossible on account of legislation which favors the wishes of those who live only for the present, and have no thought for the future. That legislation in connection with labor has seriously affected the farming industry is generally admitted. The minimum wage idea has been pushed to such an extent as to bring about a congestion of labor in cities, whilst in country districts it has arrested progress, is rapidly drying up new sources of employment, and is so likely to curtail production as to cause serious misgivings to our British creditors. Certain legislators may be very well-meaning men, but do they realise the probable effects of legislation for which they are chiefly responsible? The idea that a prosperous working class, earning high wages, can be produced merely by passing Acts of Parliament, is preposterous. Rather should legislation tend to the development of natural resources, new avenues of employment, new departures that will assist in paying our old debts, instead of strangling existing sources of employment and preventing the creating of new industries. Country industries are retreating instead of progressing, and this state of things affects the whole community. Unless the country prospers the cities must suffer. Suitable farm labor is becoming scarcer, and many farmers refrain from employing labor because that which offers is not suitable. South Australia is not increasing her products; but is decreasing them. Her wheat crop this year is deficient by probably 5,000,000bush.; butter shows a reduction of 5,500 tons as compared with last year's returns. Probably if suitable labor had been available at a fair price, a much larger area would have been put under wheat this last season, and with more and better cultivation would have given a better average return. The remedy seems to be that the kind of legislation referred to should be abandoned, and that systematic farming should be adopted, so as to afford employment to farm laborers all the year round at a wage to fairly remunerate them for working every day of the week. Under present want of system, the dairy herd is in profit about six or eight months instead of all the year, as should be the case if proper provision were made for feeding and the calving period regulated. When the cows dry off the hands are discharged, and they have no chance of being employed again until the next milking season begins unless they drift into the city and try to obtain permanent employment. It is the best men who obtain this, and they are lost to the farmer, who is then obliged to be content with the quality of labor that is left. That unskilled or inferior labor is most probably responsible for the low average product from our dairy herds, as well as for shortcomings in other departments of farm labor.

Carrieton, March 20.

Present—Messrs. W. J. Gleeson (chair), M. Manning, F. Kaerger, A. Steinke, W. H. Byerlee, and J. W. Boch (Hon. Sec.).

EXHIBITS.—By F. Kaerger, sample Ranjit wheat, 65lbs. per bushel. Two years ago he received 2lbs. seed of this from the Central Bureau, sowed it, and got return of 70lbs.; sowed again, and got 30bush. No manure was used, did not droop as other varieties did, and was not affected by the drought. His average from all varieties was barely 3bush. per acre. Sample of Bartlett's Cross-bred was the next best variety, 65½lbs. per bushel, and is good for the district in dry seasons, but a long way behind Ranjit. Silver King weighed 64½lbs. per bushel; Majestic, 63½lbs., and too late for this locality; Steinwedel, 64½lbs., very early.

THE WHEAT-TESTING MILL.—Inquiry was made as to whether the wheat-testing mill belonging to the Department of Agriculture will be available to any and every farmer for testing his wheat. [Nothing has yet been decided; but it is most probable that only one set of tests will be made of any one variety of wheat. If every farmer wanted tests made of each variety of wheat grown on his farm there would be no end to the cost and trouble.—GEN. SEC.]

Quorn, March 22.

Present—Messrs. R. Thompson (chair), J. B. Rowe, F. Herde, James Cook, C. Patten, W. Toll, H. Altmann, J. Brewster, J. W. Smith, and A. F. Noll (Hon. Sec.).

BUNT.—Mr. J. Brewster read a paper upon this subject. [His theories with regard to the nature and origin of his so-called “smut” are so erroneous that it is not advisable to publish them.—EDITOR.] Members could not understand why bunt appears sometimes when clean seed has been pickled before sowing. Mr. Altmann reasserted his oft-expressed opinion that when wheat is reaped not fully ripe it will be subject to bunt, and he instanced Steinwedel as being early and very subject to bunt. [Bunt and smut, as well as red rust and numerous other parasitic fungi, are only produced from spores (they may be called “seeds”), which are so very small that a single one can only be made visible by the aid of a powerful microscope. If there are no spores attached to the seed wheat or other grain when sown there cannot be either bunt or smut. If the seed has bunt spores attached and is sown in dry soil the spores may start growing with the slightest moisture, but will shrivel and die if the wheat or other grain does not also start to grow. If there are bunt-balls amongst pickled seed they may not have been saturated with the pickle, and when the seed is sown these bunt-balls may become broken in the drill or seedsower, and so reinfest the pickled wheat, or the drill or the seedsower may have a lot of bunt spores about them. The safest plan is to float off the bunt in pickling seed, to pickle the bags, and make sure that the drills or the seedsowers are free from spores of these parasitic fungi.—GEN. SEC.]

PICKLING SEED WHEAT.—All members agreed that seed wheat should be pickled to prevent bunt and smut; no grain known to be so affected should be used for seed.

Balaklava, March 15.

Present—Messrs. P. Anderson (chair), G. Reid, A. Manley, W. H. Thompson, W. Smith, A. W. Robinson, J. Crawford, G. C. Neville, A. Hillebrand, and E. M. Sage (Hon. Sec.).

DO FARMERS GET VALUE FOR THEIR WHEAT?—This subject was raised by Mr. P. Anderson. At present wheat was realising higher prices in Australia than in Europe, but South Australian markets were 8d. lower than those of New South Wales and Victoria, notwithstanding that the New South Wales standard of f.a.q. was lower—61½lbs.—whilst cargoes were quoted only 9d. per quarter less than South Australian. There might be differences in freight and loading expenses, but he thought not to the extent of 3d. per bushel. If farmers would co-operate they might do better with all their produce than they were doing. The Farmers' Union was not supported as it ought to be, some of the shareholders who were the largest producers supporting it less than the smaller ones. With regard to the extra value of wheat over the standard, buyers made light of the matter, but farmers should combine and

ship several parcels of high-grade wheat and test the matter for themselves, through the Union if in no other way. He thought all wheat should be bought on its merits—if the buyers docked below the standard they should pay more for the higher grades. [In discussing this matter several members repeated arguments that have been used over and over again on every occasion when the matter has been brought up at public meetings—arguments that undoubtedly bear great weight, such as extra weight over standard should receive extra price if deficient weight is to be subject to a fine.] Farmers should combine more generally, as is done by people of every other calling. The Farmers' Union was nothing less than a joint stock company, as its share list was not confined to producers, as it should be in order to properly protect its members. The producer had to ask what would the purchaser give for his produce; but he had no say in the price of what he bought. Members objected to the Chamber of Commerce fixing the f.a.q. standard so late in the season, whereby many farmers had been docked 1d. per bushel on wheat which the merchants would sell as standard wheat later on.

Davenport, March 13.

Present—Messrs. W. J. Trembath (chair), F. H. Pybus, T. McDowell, J. Roberts, W. Hodshon, sen., and J. E. Lecky (Hon. Sec.).

EXHIBITS.—By W. Hodshon, sen.—Large Lisbon onions, mild, good shape, and best for market; also smaller ones for pickling, sown late and thickly.

WHEAT-CLEANING AND GRADING.—Mr. J. Roberts read a paper to the following effect:—

If properly cleaned, Australian wheat should bring the highest export price on account of its high quality. Farmers apparently think that the saving of time and the extra bulk added to their wheat by the rubbish left in it more than counterbalance the loss of a penny or two in the price of the bushel. To clean wheat properly the grain should be in a ripe condition and the floors should be properly prepared before dumping the grain on them. Unripe grain retards milling, the flour will not be of best quality, and will be subject to weevils. Chaff, whiteheads, and straw cause inferior quality of flour, besides choking elevators, stopping machinery, and causing damage and delay in milling. Such wheat has to be sold for much less than its value if it had been well cleaned, and it damages the reputation of Australian wheat. Stones, dirt, &c., gathered up from the natural floors on a wheatfield cause damage to the machinery of the mill and discolor and damage the flour. Floors should be clean, well swept, hard clay. If these conditions cannot be secured naturally floors should be made with cement, or otherwise, or tarpaulins laid down. Bunt and smut are also damaging in every way to the value of the grain and the quality of the flour. As much as possible of these fungi should be removed by the winnower before bagging the grain. Wheat should be graded, and each variety kept separate.

Port Germein, March 22.

Present—Messrs. G. Stone (chair), E. McHugh, W. Mortess, J. K. Deer, E. G. Blessing, H. Kingcome, J. R. Gluyas, and A. H. Thomas (Hon. Sec.).

SHEEP ON FARM.—Discussion took place on paper by Mr. R. Nicholls, of Nantawarra Branch, on "Will it Pay to Keep Sheep Only?" The paper was well discussed, but members were not in accord with the views of the writer. The returns for lambs were considered too high, and members held that only in the most favored districts would the lambs be fit for market in four months. No allowance was made in estimates for losses, working, and fencing, nor for water. Members were of opinion that mixed farming would be more profitable where the rainfall was at all reliable. Mr. Deer stated that one season he made more out of 150 ewes he purchased than out of fifteen cows during the whole

year, but wool was very high, and he had a good percentage of lambs. Mr. Kingcome considered there was more to be made out sheep than out of cows if labor has to be engaged; but if the family can look after the cows they will pay. Sheep, however, will do well on stubble land that other stock will not feed on.

HORSES EATING WHEAT.—Sympathy was expressed with Mr. Millam, who lost several horses through their getting at the seed wheat, and various remedies were suggested for horses that have eaten of wheat to excess. Mr. Blessing said if remedies were not applied within ten or twelve hours little could be done, as the grain would have swollen, and inflammation soon sets in. He would give a strong purgative at once and keep the animals on the move to make them pass as much wheat as possible.

Wilson, March 22.

Present—Messrs. W. H. Neal (chair), H. Need, R. Rowe, J. Nelson, J. Coombs, H. Ward, H. F. Naudebaum, W. H. Neal, jun., A. Smith (Hon. Sec.), and one visitor.

WORMS IN HORSES.—Discussion ensued on how to rid horses of worms without weakening them. Mr. Rowe thought a good dose of salts would be effective. Mr. Naudebaum said a veterinary surgeon recommended half a pint of turps. in a pint of linseed oil in three doses, followed by a mild purgative. Sulphate of iron in a bran mash first thing in the morning was also recommended. Mr. Ward had tried turps. and linseed oil without success. Mr. W. F. Neal (visitor) said they used in the old country to give 4oz. of tobacco in a ball.

TURKEYS AS WEED-DESTROYERS.—Mr. Neal showed crop from turkey killed that morning. It was quite full, the feed consisting of a little saltbush, some grains of wheat, and the bulk being of wild oats; the bird was quite fat. Members thought that a few turkeys should help to keep down wild oats on the farm.

Forest Range, March 20.

Present—Messrs. J. Rowley (chair), F. Green, W. Cherryman, E. Rowley, J. G. Rogers, R. Green, A. Green, G. Monks, R. E. Townsend, W. McLaren (Hon. Sec.), and one visitor.

WATTLE CULTIVATION.—Mr. A. Green read a paper to the following effect:—

Will it pay to ring the stringybark trees, chop up the undergrowth, rake it up and burn it, in order to grow wattles (*Acacia pycnantha*) for the bark? He thought it would pay. It has paid in the past and he believed it would pay in the future. When the large timber has been killed and the undergrowth destroyed there is less danger to orchards from bush fires, and there would be but little grass under the wattle trees. Wattles grow very well in this locality, but one has to wait several years for the return. It is inadvisable to strip the bark too early, as later on it becomes thicker and heavier. In sowing wattle seed it is bad practice to use too much. The distance between the trees should be 8ft., as the trees will then grow quickly and the bark will be heavy. It is well to carry a hoe, chop a hole with it, and drop in the seed. Another plan is to run furrows with a plough, and drop the seeds at intervals. Boil the seeds for a few minutes before sowing [or place them in flannel, pour boiling water on them, wrap up closely, place on the hob beside the fire, and leave for forty-eight hours, or until the seeds swell.—GEN SEC.]

EXHIBITS.—By G. Monks, Lady Palmerston peach; by R. E. Townsend, dried Fellenberg plums, also Salwey peaches, and St. Patrick plum, a good late variety, still on the trees.

Arthurton, March 13.

Present—Messrs. W. H. Hawke (chair), J. Koch, J. Pearson, M. Baldock, H. Baldock, J. B. Rowe, J. Welch, W. Short, M. Lommann, H. J. Freeman, L. Crosby, S. T. Lamshed, C. L. Palm (Hon. Sec.), and visitors.

HOMESTEAD MEETING.—This meeting was held at the homestead of Messrs. Lommann and Freeman, and careful inspection was made of outbuildings, implements, garden, &c. This visit is always looked forward to, as the farm is well managed, implements up to date, and buildings substantial. Beetaloo water is laid on, and considerable quantities of tomatoes, piemelons, &c., are grown. The fruit garden is about five acres in area, there being a large number of vines, which bear heavily.

COST OF FARMING.—Mr. Short initiated a discussion on this subject, and several members promised to prepare papers for next meeting.

Inkerman, March 18.

Present—Messrs. W. Fraser (chair), W. Board, F. C. Smart, R. Kennedy, J. Lommon, and C. E. Daniel (Hon. Sec.).

PASTURES.—Mr. Board initiated discussion on sowing grasses on stubble lands. He felt that the time had arrived when those who kept sheep would have to do something to improve the pastures. Cultivation for wheat destroyed most of the natural grasses and weeds, and in their scrub lands the paddock was practically of no value for a year or so. He thought rye grass might be sown in the stubbles, also mustard, and proposed to give both a trial this year. Mr. Lommon thought a mixture of rye and rape would be useful. Mr. Smart said paddocks cut for hay were more in need of attention than stubble paddocks as the hay crop removed most of the seeds of grasses, oats, &c. Members generally agreed that something would have to be done to improve the pastures.

FENCING.—Discussion also took place on fences, different kinds of wires to use, &c. Several members wished to know whether Waite's special wire was any better than ordinary steel wire. [This is a question that the Gen. Secretary should not be expected to answer. The best plan would be to make inquiries of someone who has given both a trial.—GEN. SEC.]

Angaston, March 22.

Present—Messrs. F. Thorn (chair), R. Player, L. O. Smith, J. Vaughan, J. P. Heggie, P. Radford, W. Sibley, J. H. Snell, F. Salter, A. Sibley, E. S. Matthews (Hon. Sec.), and one visitor.

BEST BREED OF PIGS.—After discussion members concluded that the best "breed" of pigs is the progeny of a Tamworth boar and Berkshire sow crossed back with a Berkshire boar.

EARLY GREEN FEED FOR SHEEP.—Members consider rye to be the best to sow for early green feed in this locality; but rape, mustard, barley, and kohlrabi are to be recommended also.

CODLIN MOTH.—Members will endeavor to collect all available information upon codlin moth, and to discuss the matter at next meeting.

EXHIBITS.—Mr. R. Player tabled splendid samples of Ranjit, Marshall's Hybrid, Silver King, and Majestic wheats, grown from seed sent by Central Bureau for trial. The Ranjit is apt to go down badly, but otherwise is a good variety.

PAPER.—Mr. F. Salter read a lengthy paper concerning his recent visit to New Zealand.

Minlaton, March 22.

Present—Messrs. J. Anderson (chair), D. G. Teichelman, R. G. Newbold, M. Twartz, E. Correll, A. McKenzie, S. Vanstone, J. Bennett, G. D. Mayer, H. Martin, T. Brown, Jas. McKenzie (Hon. Sec.), and five visitors.

TAKEALL.—Mr. McKenzie said he had takeall, black rust, and red rust together in one paddock that had been fallowed. Many of the members ascribed takeall to dry ploughing, especially where dry grass or stubble are turned under.

BURNING STUBBLE.—Members agreed that it is better in this locality to burn stubble than to plough it in, as there is always a better crop on burned stubble land than where it is ploughed under dry.

EXHIBITS.—Chairman tabled samples of Gamma and World's Champion wheat. Gamma had large heads, badly rusted, and World's Champion was totally ruined by rust. Mr. Correll tabled excellent sweet ensilage, also very good separator butter. Mr. S. F. Hoyle showed a "Crown" separator, and explained its working.

Gumeracha, March 25.

Present—Nine members.

ANNUAL MEETING.—Retiring officers were thanked. Mr. A. Moore elected Chairman, Mr. W. J. Hannaford Vice-chairman, and Mr. T. W. Martin re-elected Hon. Secretary.

TIMBER TREES.—Members agreed that it is desirable that more attention should be given to planting suitable timber trees along the roads; and generally throughout the State, more trees should be planted. Mr. W. A. Lee argued that, although trees on roadsides kept the roads somewhat damp during winter, the damage was more than compensated by the shade afforded during the fierce heat of summer.

Amyton, March 20.

Present—Messrs. Joseph Gum (chair), Wm. Gum, Thos. Gum, Alex. Gray, John Gray, James Gray, S. Thomas, Wm. Hughes, John Kelly, G. Wheadon, F. Mullett (Hon. Sec.), and one visitor.

IMPROVING BUREAU.—*Re* Mr. Grasby's "suggestions," members think the exact status of the proposed "ordinary" members seems to be rather indefinite, and not much in advance of the present "visitor." It is most desirable to have the young men present who probably will be self-dependent farmers in a few years, and will benefit from present attendance at Branch meetings. It was thought that quasi-membership would be more agreeable to such persons than to be "visitors." Several members favor increase to twenty. The only other practicable suggestion appeared to be that of the circulating library, which members thought would be useful, even if started on a very limited scale.

Koolunga, March 20.

Present—Messrs. T. B. Butcher (chair), J. Button, J. Sandow, E. J. Shipway, W. T. Cooper, J. Pengilly, T. Freeman, W. Aunger, R. Lawry, J. Butterfield, J. C. Noack (Hon. Sec.), and two visitors.

BUNT.—Question by Mr. J. Pengilly—"Why are early varieties of wheat more subject to bunt than the later sorts?" Mr. J. Button and Mr. T. Freeman said early-maturing wheats are usually sown later in the season, in damp soil, and often misty weather. Mr. Pengilly said the earlier wheat, being

usually heavy, contains more oily matter, and consequently requires stronger pickle. Wheat intended for seed should be thoroughly ripe when reaped. The chairman said that although pickling had been more universal last season than ever before, the crops had been badly bunted. Some members blamed the drills for this, others doubted the purity of the bluestone. Others asserted that where pickled and unpickled wheat was sown side by side, the pickled crop was badly affected whilst the other had much less bunt! One or two members seemed to be convinced that pickling is quite useless; whilst others firmly believe in its efficacy. [Quite right, too. Try this experiment. Get some clean wheat, break a number of bunt balls and mix with it; pickle 100 grains in strong pickle, and keep for a week before sowing. Pickle another 100 grains and sow at once. Also sow 100 grains without pickling. The first lot will give a crop absolutely free from bunt; the second may have a little bunt; and the third, unpickled lot, will produce no clean grain.—GEN. SEC.]

Caltowie, March 24.

Present—Messrs. N. Hewett (chair), A. Kerr, J. Leahy, J. Potter, L. Graham, J. Neate, A. McDonald, A. McCallum, J. McCallum, S. Wenham, G. Petatz, F. Lehmann (Hon. Sec.), and three visitors.

FORESTS AND TIMBER SUPPLY.—Discussion took place on paper read at Brinkworth by Mr. A. L. McEwen on this subject. Mr. Kerr maintained that timber, both for fencing and firewood, was cheaper to-day at Caltowie than forty years ago. Mr. McCullum said the reason for this was that so many farmers' teams from the dry areas were carting for a living that the cheapness was largely a matter of labor supply. The posts they got twenty-five years ago were better than they got now, as sleeper-cutting had resulted in the best trees being removed, and it was now very difficult in many parts to get a good tree for troughs and such purposes, Mr. Wenham said £5 per 100 was asked now for good redgum posts delivered at Caltowie.

PICKLING WHEAT.—In reply to question asked by member of Eudunda Branch as to whether pickled wheat would be injured if kept for a month, Mr. Kerr stated that some he sowed two months after pickling germinated just as well as some pickled only two days before sowing. Some very dirty seed was pickled and sown a month later and the crop was quite clean. Mr. Hewett deemed it necessary to pickle in this district, but for twenty years he sowed unpickled seed in the Port Pirie district and reaped clean crops. It was generally agreed that keeping pickled seed for six or eight weeks did not injure it. Members knew of instances where some had been kept over until the following season and produced a crop then that was quite free from bunt.

CLEANING WHEAT FOR MARKET.—Discussion took place on question of cleaning wheat twice. Mr. Graham did not see the necessity for it if once through the winnower resulted in a marketable sample; years ago even the cleanest of wheat was put through twice, but unless the standard was raised and the price accordingly the farmer gained nothing. Mr. Wenham said that all farmers should clean their wheat thoroughly as they would benefit in the end; the grain removed in the cleaning was not wasted as the farmer could use it for feeding purposes. Mr. Kerr could see no reason for putting a clean sample through a second time; this year he made a 66lbs. sample with one run. With their improved machines once was sufficient. It was generally agreed that it was not advisable to run the wheat through twice if one run will produce a good marketable sample.

Rhine Villa, March 24.

Present—Messrs. H. Mickan (chair), W. Farey, T. Edson, F. F. Payne, W. Scott, A. Lewis, and J. W. Vigar (Hon. Sec.).

SAND-BINDING PLANTS.—Mr. T. Edson favored Johnson grass for sandy localities. [Evening primrose and blue lupin are also good for sandy soils.—**GEN. SEC.**]

COST OF AN ACRE OF WHEAT.—The Hon. Secretary estimated that the cost of growing an acre of wheat in this locality would be about 12s. 6d., made up as follows:—Ploughing, 6s.; harrowing, 9d.; seed and sowing, 2s. 6d.; reaping, 2s. 6d.; cleaning two bags wheat, 9d. The two bags wheat, 8bush., at 2s. 3d. per bushel, 18s. Mr. Farey thought the cost was too high. Mr. Edson thought that down the Rhine, on the very light soil, the cost would be about 7s., and the average yield about 4bush.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of March, 1902:—

Adelaide	0.99	Manoora	1.22	Macclesfield	3.52
Hawker	0.26	Hoyleton	1.48	Meadows	4.33
Craddock	0.56	Balaklava	1.59	Strathalbyn	1.53
Wilson	0.29	Port Wakefield	1.45	Callington	1.05
Gordon	0.36	Saddleworth	1.05	Langhorne's Bridge..	1.27
Quorn	0.96	Marrabel	1.35	Milang	0.98
Port Augusta	0.54	Riverton	2.06	Wallaroo	1.20
Port Germein	1.08	Tarlee	1.57	Kadina	1.13
Port Pirie	0.37	Stockport	1.61	Moonta	1.22
Crystal Brook	1.18	Hamley Bridge	1.60	Green's Plains	1.40
Port Broughton	0.85	Kapunda	1.50	Maitland	1.31
Bute	1.30	Freeling	2.02	Ardrossan	1.16
Hammond	0.29	Stockwell	1.47	Port Victoria	1.08
Bruce	0.41	Nuriootpa	1.91	Curramulka	1.08
Wilmington	1.27	Angaston	1.34	Minlaton	1.24
Melrose	0.67	Tanunda	1.98	Stansbury	1.75
Booleroo Centre	0.31	Lyndoch	2.60	Warooka	0.95
Wirrabara	0.84	Mallala	1.63	Yorketown	1.01
Appila	0.36	Roseworthy	1.66	Edithburgh	0.83
Laura	0.44	Gawler	2.25	Fowler's Bay	0.16
Caltowie	0.53	Smithfield	1.53	Streaky Bay	1.75
Jamestown	0.55	Two Wells	1.12	Port Elliot	0.20
Gladstone	0.45	Virginia	1.15	Port Lincoln	0.81
Georgetown	0.58	Salisbury	1.62	Cowell	1.50
Narridy	2.42	Teatree Gully	1.82	Queenscliffe	0.43
Redhill	2.07	Magill	1.67	Port Elliot	0.79
Koolunga	1.27	Mitcham	1.66	Goolwa	1.11
Carrieton	0.12	Crafers	4.28	Meningie	1.65
Eurelia	0.14	Clarendon	2.60	Kingston	1.11
Johnburgh	0.05	Morphett Vale	2.57	Robe	0.81
Orroroo	0.10	Noarlunga	2.06	Beachport	1.23
Black Rock	0.09	Willunga	2.63	Ocoonalpyn	0.85
Petersburg	0.28	Aldinga	2.06	Bordertown	1.06
Yongala	0.32	Normanville	1.11	Wolseley	0.53
Terowie	0.31	Yankalilla	1.10	Frances	0.98
Yarowie	0.47	Eudunda	1.06	Naracoorte	1.22
Hallett	0.74	Truro	0.34	Lucindale	1.21
Mount Bryan	1.06	Mount Pleasant	2.55	Penola	0.86
Burra	0.71	Blumberg	2.84	Millicent	1.07
Snowtown	1.43	Gumeracha	3.39	Mount Gambier	1.08
Brinkworth	1.47	Lobethal	2.68	Wellington	1.70
Blyth	1.32	Woodside	2.26	Murray Bridge	1.02
Clare	2.03	Wahndorf	3.37	Mannum	1.01
Mintaro Central	1.49	Nairne	2.50	Morgan	0.44
Watervale	2.47	Mount Barker	3.23	Overland Corner	0.57
Auburn	2.08	Echunga	2.13	Benmark	0.35

INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

Number of Persons Registered and Found Employment by Government Departments and Private Employers from February 26 to March 22, 1902.

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youths	84	82	190
Masons and bricklayers	6	—	2
Plasterers	1	—	3
Carpenters	4	1	2
Carriage builder	1	—	—
Painters	3	1	3
Fitters and turners	2	1	—
Enginedriver and fireman	—	1	—
Boilermakers and assistants	2	1	2
Blacksmiths and strikers	6	2	—
Iron moulders	2	—	1
Plumber and ironworker	1	—	—
Driller	1	—	—
Shipwright	—	1	—
Mariner	—	1	—
Fettler	1	—	—
Patternmaker	—	1	—
Compositors	3	—	9
Chainmen	—	—	3
Apprentices	5	3	2
Cleaners	3	3	—
Porters and junior porters	14	3	1
Rivet boys	1	—	2
Totals	140	101	220

March 25, 1902.

A. RICHARDSON, Bureau Clerk.

CONTRIBUTED BY THE CHIEF INSPECTOR OF FACTORIES.

Glancing over the machinery exhibits at the recently held show, I was naturally attracted to anything new in the shape of safeguards to dangerous parts of the various classes of engines, and the shafts and couplings connected with them for transmitting power.

The most noticeable feature in this direction was the improved crank guard attached to several gas engines exhibited by Messrs. Bagshaw & Co. In a former notice on this subject I gave a description, accompanied by a block, of a crank guard that I wished to see affixed to all engines, where practicable. The guard shown on the engines at the recent show is an improvement on the one referred to, and consists of a piece of sheet steel bolted to the engine bed under the crank, and curved over the crank and continued to the upper shell of

the cylinder. It is sufficiently wide to cover the crank and connecting rod, and renders the work of oiling and examination of bearings comparatively safe. This guard is particularly adapted for gas and oil engines.

Speaking on the subject of set screws, which are too often found projecting from 1 in. to 3 in. from the couplings of shafts and pulley bosses, Mr. Bagshaw informed me that he is making an effort to introduce a system of fastening couplings and such like by means of a grub-screw. This screw buries itself in the coupling socket or pulley boss, as the case may be, and is screwed securely home by means of a key which fits into a square cavity in the head of the screw. When screwed tightly home the head is flush with the outer surface of the coupling socket, presenting a smooth-running surface. Projecting set screws are highly dangerous, particularly when situated close to lubricators or other parts of the revolving shaft where workpeople are necessarily employed, for the reason that they are apt to catch in the clothing and inflict serious injury before the machinery can be stopped.

When it becomes necessary to use a projecting set screw or key, a wooden mask should be clamped on the shaft to guard the dangerous part against becoming entangled in clothing, &c. The mask is very simple and cheap of construction. It consists of a small turned block of wood, with a hole in the centre the size of the shaft or coupling, and a cavity to receive the set screw or key to be covered. It is then sawn in two and clamped over the dangerous part by means of four screws, the holes for which have been counter-sunk, to allow the heads to go well into the wood. This mask presents a smooth-running surface, and is easily removed when it becomes necessary to have access to the set screw or key.



Journal of Agriculture

AND

Industry.

No. 10. REGISTERED A6]

MAY 1, 1902.

[A NEWSPAPER.

VOL. V.

NOTES AND COMMENTS.

The weather during April has been very warm and dry, and nearly approaches the record for this month. The grass that sprang after the March rains has suffered severely, and a good soaking is required at an early date to ensure anything like a good grass season. Farmers have been busy seeding, and in many districts operations are well advanced; the weather on the whole has been favorable to the destruction of rubbish on the fallows. In some of the earlier districts the lambing is reported to be unsatisfactory, the absence of green feed being very much felt. Good prices are being realised for all farm and dairy products, and those farmers who have not disposed of all of their wheat will welcome the steady advance in price for that commodity. The scarcity of apples and consequent high price for the local article has caused the importation of Tasmanian apples, the quality being very good.

There are several of our exchanges the editors of which constantly copy wholesale from our pages, without acknowledging the source from whence clipped. It is *not* sufficient to mention that an article was written by such and such a person. Suppose an honest editor were to re-copy such an article, he would naturally state that it was written by so-and-so for such and such a paper. A dishonest editor, with many exchanges, sharp scissors, and a pot of paste, can "commandeer" the services of all the talent of the world for the use of his paper, but he cannot command the respect of anyone.

With a view to testing the efficacy of the formalin solution as a preventive of bunt, several school teachers were supplied last season with badly-infested seed wheat and formalin solution, with instructions also for pickling with bluestone solution and hot water. The seed was made nearly black by rubbing it with a considerable number of bunt balls, so that the test was very severe. In each case where the teachers have furnished reports the unpickled seed when sown produced plants which were badly affected by bunt. Hot water treatment resulted in only slight infection; formalin solution and bluestone solution were exceedingly satisfactory, there being scarcely a trace of bunt. The formalin was used at strength of 1 to 400 parts of water; bluestone $\frac{1}{2}$ oz. to gallon of water, and in the hot water treatment the temperature was 140° F. to 150° F. There is no doubt that the formalin solution is effective; it is simpler, and probably as cheap as bluestone, though it is apparently no better as a pickle.

▲

The Government Geologist has furnished to the Minister of Mines a report on a discovery of nitrogenous guano of a very unusual character near Yunta. The deposit occurs in a cave on the eastern side of a hill of quartzite and quartzose sandstone forming a capping about 200ft. thick on sandstone grit, conglomerate, and soft slate. The inner portion of the cave is partially filled with a deposit of greyish-yellow color which shows, on analysis, to contain 23.44 per cent. nitrogen and 7.1 per cent. of potash. Besides this guano there is a deposit of sandy material in which are found fragments of small bones and other detritus. Although the guano is very valuable, Mr. Brown states that the deposit cannot as a whole be very large, as the caves are limited in size.

There are very few people who know the differences that exist between various moths and their caterpillars; but when they find a caterpillar, or a grub, or a worm, or a maggot in or amongst plums, tomatoes, potatoes, apricots, or dried fruits of any kind, they at once loudly proclaim, or write to the newspapers stating that they have found "the codlin moth" in those articles. If they would place the article on which any of these forms of animal life exist in a ventilated glass case, the matured form of the pest would probably soon develop; but there would still be a doubt as to whether they could tell whether they had "hatched" a fly, a beetle, or a moth. Up till the present hour no authentic case has been recorded where caterpillars found in any other fruit than apples, pears, or quinces have developed the codlin moth.

It would be a patriotic act on the part of each and every owner of useless apple and pear trees were he to cut them down, and thus lessen the breeding spots and harbors for codlin moths. Such trees bear worthless fruit, and therefore the owners generally will not trouble themselves to spray, bandage, and collect and destroy the fruit. If they fail to destroy the trees they could still do good service to their careful fellow fruitgrowers by cutting the useless trees hard back, so that no fruit can be produced for two or three years after; or they can have the trees grafted or budded with superior varieties which will pay for the spraying, &c.

A fruitgrower who owns a couple of acres of miscellaneous fruit trees recently sent a tin containing plums to the editor of an Adelaide newspaper, and stated that they were attacked by the caterpillars of the codlin moth. That statement, entirely unsupported by any competent entomological authority, has been copied by some of the inter-State newspapers, to the injury of our export fruit business. There is very little doubt in the minds of most people who know anything about entomology that the caterpillars in the plums were those of our indigenous *Cacaesia*, which is kept in check by its own particular parasites. Editors of newspapers should be more careful about publishing bald unsupported statements such as the above.

Many of our cultivators of the soil appear ignorant of the general appearance of some of our most useful insect friends. This is particularly the case with cultivators of small gardens in the city and suburbs, and the principal

sufferers are the pupæ of the various lady-birds. It is quite a common occurrence for officers of the department to be told of the damage being done by an "ugly black insect with red markings and without any wings," and sometimes the complaint is accompanied by the statement that hundreds have been caught and destroyed. The surprise of the grower on being told that this insect is the pupa of one of the lady-birds is evidence of the necessity for education in this direction, but the difficulty is to know how to reach the persons interested, the majority of whom never trouble to look at any agricultural paper which might assist them. Probably the only way to reach most of these people would be through the columns of the daily press, and then the difficulty of securing accurate illustrations on the class of paper used presents itself.

"A list of the insect pests known to attack the apple in Australia and Tasmania," by the State Entomologist of Tasmania (Arthur J. Lea, F.E.S.), in a late issue of the Tasmanian *Agricultural Journal*, enumerates seventy-three species and varieties, including nine of Lepidoptera (moths), thirty of Coleoptera (beetles), twelve Homoptera (scales, aphides, &c.), three Heteroptera (bugs), six Orthoptera (locusts, earwigs, &c.), three Diptera (true flies), one pear slug or leach, one termite (white ant), one thrip, and four Acaridæ (or mites). Of these seventy-three pests the worst are fourteen that have been introduced, including codlin moth, the curculio beetle, the San Jose scale, the greedy scale, American or woolly blight, mealy bug, cottony cushion scale, black or brown scale (olive scale), soft or ivy scale (orange, &c.), mussel scale, apple aphid, and parlatoria scale, an earwig, the Mediterranean and Queensland fruit flies, the pear or cherry slug, and the bryoba mite.

The "general purpose cow" is one of the chimeras that is sought for but will never be found by the man who wants a large "vealer" once a year, 20lbs. of butter once a week, and 800lbs. of fat beef when the cow is 12 years old. Even supposing that such a cow were attainable, the beef part of the animal would have to be maintained for the whole period of her life, and the food to do this would swallow up the value of the beef over and over again. The annual calf is not developed except at the cost of extra food, nor is the milk, or butter, or cheese. But the milk, butter, or cheese can be sold and profit realised week by week, whilst the beef (such as it may be) gives its return only at the end of the twelve years. The nearest approach to the "general purpose cow" is one from the milking family of Shorthorn or Durham. For butter alone, take the Jersey cow; for cheese, the Ayrshire; for beef, the Hereford or Shorthorn.

Investigations, numerous and scientifically conducted, have shown that from 300 to 500 tons of water are required to produce 1 ton of dry vegetable matter. Two tons of hay require at least 1,000 tons of water to produce it from seed till stacking the crop. The water does not all come from the clouds, because all friable soils possess the power to absorb moisture from the air. All well-informed farmers and gardeners are now aware that by maintaining a loose surface on their cultivated land, not only is there a considerable absorption of moisture from the air—especially at night—but the loose surface prevents escape of moisture from the lower soil by breaking up its capillarity.

People who have read much about the influence of large areas of forest trees upon climatic conditions, and who have studied the subject from all points, entertain no doubts upon the subject—they are convinced that humidity and temperature of the air, retention of moisture in the soil, maintenance in the flow of watercourses, and many other beneficial effects follow the existence of large areas of forest trees in any country. But, let us ignore all that portion of the matter, if by so doing we can persuade occupiers of land throughout the State, and especially the northern parts, to plant forest and timber trees extensively. It is of little use to plant single rows of trees on an open plain, because the wind will keep them stunted, even if it does not kill them. At least six rows should be planted as a windbreak, or clumps set out in corners. Besides beautifying the landscape, the trees will furnish shelter, timber, firewood, fencing material, and other requisites on the farm.

Mud on paint absorbs oil from the paint and leaves it in a disintegrated or powdered form, so that the paint loses its gloss and soon perishes. For this reason all wagons and other vehicles, implements, whether of wood or iron, should be cleaned after use. If put away for a time, the painted surface should be covered with grease, as this will keep the paint fresh.

Next month is a good time for planting trees of all kinds. Timber trees should be planted 6ft. to 8ft. apart, and be thinned out when they are large enough. Do not plant in holes, as they get filled with water when rain comes, and the roots are drowned, or the soil will shrink with drought and the roots will be roasted. Plough as deeply as is possible, pulverise the soil down to the bottom of the furrows, and plant the trees firmly.

Next month is the time for sowing of wattle seeds (*Acacia pycnantha*). Prepare the land now by ploughing and pulverising in rows 4ft. apart. In June bury the seeds 2in. deep at 2ft. apart, and tread the soil down on them. The seeds should be covered with scalding water, then wrapped in flannel wetted with scalding water, and kept by the fireside two or three days until they swell. Sandy loam is the best for wattles, but they will grow on almost any soil.

Drifting sand is an evil that must be dealt with promptly in very many parts of this State. Valuable land in large areas is becoming covered with sand, and traffic on roads is made extremely heavy and difficult for the teams. It is hardly worth while to raise one or two crops of hay or cereals by clearing the indigenous vegetation from a sandhill which in a short time will drift on to adjacent valuable arable lands and ruin them. Such sand drifts already existing should at once be sown with rye, barley, or other covering crops, and as soon as possible afterwards planted with tamarix, gorse, or other trees or shrubs in rows across the line of prevailing winds. These rows could be established at distances of thirty yards apart, and the spaces between sown with Aleppo grass (*Sorghum halepense*)—commonly called "Johnson grass," "Phillips grass," &c.—or any other approved plants.

Many farmers complain that much of their superphosphate is sticky and difficult to run through the drills. Some of them mix pulverised sheepyard manure, or shell sand, or even pure sand, with the super. and find it is a help. Others try lime, which is a very serious mistake. The most rational and practical method is to mix super. with bonedust, because if there is an excess of acid in the super. (which is generally the case) it will act to a certain extent upon the bonedust, and the soil will benefit from the admixture for several years. A goodly number of farmers speak already of the advantages resulting from the practice of mixing sticky super. with bonedust, and those who have not adopted the method would do well to try the experiment on a portion, if not the whole, of their crops.

So many farmers have experimented with feeding bonemeal to their cattle with beneficial results in preventing inflammation and impaction, that the practice can be recommended with confidence in every district where the animals are restricted to a diet of dry, fibrous, and comparatively innutritious nature. "Impaction," or whatever may be the disease which carries off so many cattle—and even sheep—is mostly prevalent during the latter part of autumn and early winter. At that time farmers and others should feed ensilage by preference if no green feed is grown, or in absence of these fodders, feed chaffed hay or steamed straw, sprinkled with molasses and water, together with a handful of bonemeal, a little salt, and, perhaps, a very small quantity of sulphate of iron occasionally.

RAPE FOR PIGS.

The following summary of experiments to test the value of rape for pigs, carried out at the Wisconsin Agricultural Experiment Station, is of great interest to pig-raisers:—

"That with pigs from four to ten months old, representing the various breeds of swine, an acre of rape, when properly grown, has a feeding value, when combined with a ration of corn and shorts, equivalent to 2,436lbs. of a mixture of these grain feeds, and a money value of \$19.49 per acre.

"That rape is a better green feed for growing pigs than good clover pasture, the pigs fed upon rape having made on the average 100lbs. of gain on 33.5lbs. less grain than was required by the pigs fed on clover pasture.

"That pigs are more thrifty, have better appetites, and make correspondingly greater gains when supplied with a rape pasture in conjunction with their grain feed than when fed on grain alone.

"That a plot of Dwarf Essex forage rape, when planted in drills 30in. apart early in May in Wisconsin, will yield three good crops of pasture forage in a favorable season.

"That rape is the most satisfactory and cheapest green feed for swine that we have fed.

"That every feeder of hogs in Wisconsin should plant each spring a small field of rape adjoining his hog yard, and provide himself with a few rods of movable fence, to properly feed the rape to brood sows and young pigs.

"That rape should be sown for this purpose in drills 30in. apart to facilitate the stirring of the ground and cultivation after each successive growth has been eaten off.

"That hogs should not be turned upon a rape pasture until the plants are at least 12in. to 14in. high, and that they should be prevented from rooting while in the rape feed.

"That rape is not a satisfactory feed when fed alone when it is desired to have any live weight gain made in hogs, though it has been found that they will just about maintain themselves without loss of weight on this feed alone."

ANALYSES OF FERTILISERS.

By W. L. SUMMERS, INSPECTOR OF FERTILISERS.

The following table gives the results of the analyses of various samples of fertilisers obtained by myself during the current season. Where more than one sample of any brand has been taken, the analysis of each sample is given. The guarantee shown in the table is the registered guarantee furnished by the vendors to the Inspector of Fertilisers, as required by the Fertilisers Act.

Analyses of Samples of Fertilisers obtained by Inspector of Fertilisers.

Vendor.	Brand.	Water Soluble Phosphate.			Citrate Soluble Phosphate.		Acid Soluble Phosphate.		Nitrogen.	
		Guarantee.	Official Analyses.	per cent.	Guarantee.	Official Analyses.	Guarantee.	Official Analyses.	Guarantee.	Official Analyses.
George Wills & Co.	Concentrated Super.	49.0	per cent. 96.9		8.0	per cent. 10.9	per cent.	per cent.	per cent.	per cent.
Do.	United Alkali Co. Super.	36.0	38.0, 37.6							
Do.	do.	37.0	39.0, 38.5							
Clutterbuck Bros.	do.	37.0	39.0, 38.5							
Do.	do.	36.0	38.0, 37.6							
Do.	Packard's Super.	36.0	40.0							
			39.2, 39.8,							
			37.4, 36.3,							
Elder, Smith, & Co.	Lawes' Super.	36.0	37.3, 36.5							
Gibbs, Bright & Co.	Ohlendorff's Super.	36.0	40.0 39.9 37.1							
S.A. Farmers' Co-operative Union	do.	36.0	39.9, 37.1							
Do.	do.	36.0	37.6							
Do.	United Alkali Co. Super.	36.0	39.0, 38.5							
Australasian Implement Co.	do.	36.0	37.3, 39.2							
Do.	do.	36.0	40.0							
Do.	Ohlendorff's Super.	36.0	39.5, 37.6							
Do.	Shirley's Super.	36.0	37.7, 37.5, 37.1							
Wallaroo Phosphate Co.	Wallaroo Super.	36.0	37.8, 39.2							
Norman & Co.	Cross & Co.'s Super.	36.0	39.8							
Do.	Reliance Super.	36.0	38.7							
F. H. Snow	Sheep Brand Super.	36.0	38.7							
D. & J. Fowler	do.	36.0	38.7							
Do.	Lion Super.	40.0	43.3							

Adelaide Chemical Works Co....	Mineral Super.	{ 47.1, 38.6, 37.6 }	2.0	—	7.0	—	—
Do.	Complete Manure	{ 39.8, 40.8 }	6.2	—	3.2	—	—
Do.	Guano Super.	{ 22.6, 25.2, 27.1 }	15.0	{ 3.7, 3.9, 4.2 }	3.1	—	—
Do.	Super B.	{ 25.3, 39.5 }	15.2	{ 1.5, 1.3 }	2.3	—	—
Do.	Bone Super.	{ 24.7, 32.4 }	9.8	{ 3.6, 3.8 }	5.5	—	2.6
Do.	Orchard and Potato Manure	{ 16.2 }	10.0	{ 22.0 }	5.0	—	1.6
Do.	Bally Bonedust	{ 23.0 }	—	—	52.0	54.8	3.74
Do.	Bonedust	—	—	—	45.0	45.0, 53.5	4.0
Do.	Calcutta Bonedust	—	—	—	50.0	49.6, 56.5	3.25
J. C. Kuwoldt & Son	Bonedust	—	—	—	48.0	—	3.5
Crompton & Son	do.	—	—	—	44.5	44.7, 50.0	3.9
Mehrtens & Co.	do.	—	—	—	43.77	{ 45.6, 46.9 }	{ 3.8, 4.4 }
L. Conrad	do.	—	—	—	41.12	46.7, 43.6	3.2
Geo. Wills & Co.	Alberts' Thomas Phosphate	—	—	—	35.0	39.7	—
Elder, Smith, & Co.	Bilston Thomas Phosphate	—	—	—	39.5	44.7, 41.8	—
F. H. Snow	Thomas Phosphate, Star Brand	—	—	—	37.0	41.4	—
Norman & Co.	Scotia Basic Slag	—	—	—	28.0	32.2	—
Adelaide Chemical Works—	Muriate of Potash—60.0 per cent. potash.	—	—	—	—	—	—
Geo. Wills & Co.—	Muriate of Potash—59.6 per cent. potash.	—	—	—	—	—	—
F. H. Snow—	Muriate of Potash—62.4 per cent. potash.	—	—	—	—	—	—

* Also contains 3.1 per cent. potash.
 † This concentrated super. contains 44.34 per cent. water-soluble phosphoric acid and 4.99 per cent. citrate-soluble phosphoric acid. For purposes of comparison, however, the figures in the above table are given in same terms as used for ordinary super.

As far as the imported manures are concerned the season is practically over, but the local works are still busily employed. This season the imported manures came to hand earlier than usual—too early, a number of farmers complained; but there is little doubt that in the interests of all concerned it is better to have them early than late. As it is the welcome fall of rain will doubtless cause purchasers of the local makes of manures to ask for prompt delivery, frequently a matter of considerable difficulty, owing to it being often impossible to secure necessary railway trucks and sheets. It would doubtless pay farmers better to secure their supplies earlier in the season, rather than risk having to delay seeding operations on account of the difficulty in handling such immense quantities of fertiliser within so short a time. On more than one occasion during the present season vessels were in port at the same time with shipments totalling from 60,000 to 70,000 bags of manure; and when the local output is taken into consideration, it will readily be seen that a very large number of trucks are required to move this quantity. When, as has been the case in several seasons, the vessels arrive later than expected, farmers have, perhaps, to stop seeding operations for want of manure.

MANURING OF GRASS LANDS.

By W. L. SUMMERS, INSPECTOR OF FERTILISERS.

Except in a few isolated cases, it may safely be stated that the manuring of permanent pasture lands has been almost entirely neglected in South Australia. The splendid growth of grass following a cereal crop manured with phosphates has frequently been noted, and it seems rather strange that with such illustrations before them more farmers have not tested for themselves the profit of direct application of manures to pasture lands, particularly where the perennial grasses have not been destroyed by cultivation. At the Annual Bureau Congress last September Professor Lowrie stated that a field of 150 acres, in crop the previous year, was carrying 168 sheep and 104 lambs, and that he was confident that from the lambs alone he would realise 8s. per acre from the grass growing on it. Ten years ago this paddock would not have carried one-third of the stock. Many farmers have stated that where the land is left to grass after manuring the cereal crop the increase in the feed on the land has fully paid for the cost of the manure. This being so, can there be any doubt that direct manuring of grass land will pay? In other countries this has been so often demonstrated that the matter is never questioned, and it is no uncommon thing for landowners to apply manures at an outlay of 12s. to 25s. per acre with the certainty of getting a profit. Our circumstances are of course very different, and no one acquainted with the climate and economic conditions would advocate expending so much on the average grass lands, but there is no reasonable ground for doubt that an outlay of 4s. to 5s. per acre will pay. It is frequently remarked by farmers that their stock will leave the stubble and grass on unmanured land for that on the manured portions. Why is this? Simply that the feed on the unmanured portion is lacking in phosphates and inferior in quality. This alone makes the question of manuring of pasture land worthy of serious consideration. The prevalence of the complaint in sheep and cattle, particularly the latter, variously known as "cripples," "staggers," &c., is undoubtedly largely due to the insufficient supply of phosphates in the feed. Manuring will not only increase the quantity of grass, but will help to prevent stock troubles brought on by impoverishment of the feed.

The necessity for and profitableness of manuring being admitted, two points of importance arise. First, what manures to apply; second, how to apply them. In dealing with the question of what manures to use our experience in the manuring of cereal crops is not of great assistance. With wheat we want to get as much of the manure as possible back in the crop, and consequently find the water-soluble phosphates best; with grass, on the other hand, we want some manure that will give a profit the first year and at the same time show a benefit over at least four years. Manuring grass land every four years is as much as any of our farmers can be expected to do, and in order to avoid too much expense at once some portion can be treated each year so as to manure the whole by degrees. With the object of arriving at a satisfactory mixture for grass lands I have had several interviews with the manager of the Adelaide Chemical Works. Our aim has been to secure at a price not exceeding £4 10s. per ton a mixture containing about 30 per cent. of phosphate of which about one-half only shall be soluble in water, $1\frac{1}{2}$ per cent. nitrogen, and $1\frac{1}{2}$ per cent. of potash, and I am pleased to say that a manure nearly approximating these figures will be placed on the market shortly. Then comes the question of distribution; broadcasting 1 cwt. evenly over an acre of land is not such a simple matter as it seems, and in some weathers would not be a pleasant task. Drilling it on the surface is not sufficient, as the manure will be in narrow rows.

In order to prevent the manure being washed into the hollows it will be necessary to harrow lightly across the slope of the land to mix it somewhat with the surface soil and to hinder the run of water for a time. Probably allowing the manure to drop from the drill with the hoes raised somewhat and then harrowing across the rows will settle the difficulty of distribution. Using chain harrows after the drill would improve matters. On this point, however, the experience of farmers would be valuable.

In connection with this matter the Hon. Minister of Agriculture has approved of tests being made at Crystal Brook, Maitland, Riverton, Mount Pleasant, Strathalbyn, and Normanville. In each case there will be five manured plots, each of two acres, and a narrow strip unmanured between each plot. Five different mixtures will be tried, mineral super. being omitted from the list as being entirely water soluble and not as likely to show results over a period of four or five years. The department supplies the manures free of cost, and amongst the conditions of the tests it is provided that stock shall not be allowed to graze on the plot before the middle of August, that the land be left to grass for at least two years, and that reports on results are furnished by the owner of the land. I am pleased to be able to state that a large landowner in the South-East is carrying out tests on a very large scale this year, and will manure over 400 acres of grass land at a considerable cost, being satisfied that the pasture land is in need of improvement.

FARM HINTS FOR MAY.

BY THE EDITOR.

Where seeding is not already finished in the earliest districts it is not too late to advise the sowing of rust-resistant varieties of wheat. There are several sorts that are of good milling quality, that yield well, and possess all the other qualifications desired by farmers, millers, and wheatbuyers.

There appears to exist a majority of opinion that most of the so-called "takeall" is caused by a hollow condition of the seedbed. When the land is ploughed up during dry weather the soil does not settle down, but remains hollow and in clods. After the seed starts there is enough moisture to keep the plant going for a time, but later on the hollow soil becomes dry, the roots cannot find sufficient moisture, and the plant withers off. A pulverised loose surface is beneficial to all plants, but a hollow cloudy subsoil will be fatal to almost all plants.

Bunt (*Tilletia caries*) is the "ball smut" of the wheat. Smut (*Ustilago carbo*) is the "loose smut" which occurs on wheat, barley, oats, rye, and some grasses. Bunt seldom occurs elsewhere than on wheat. Both bunt and smut are parasitic plants living within the tissues of other plants which they have attacked. But the seeds of bunt and smut appear only when the seeds of the wheat or other host plant ought to have been formed. A single bunt ball contains myriads of microscopic spores (or seeds), any one of which, being attached to a grain of wheat, or barley, or oats, is capable to infect the plant resulting therefrom, and will cause what is known as bunt or as smut. If the seed is sown in dry soil the spore may start to grow, but, if the wheat grain, &c., does not also start, the bunt or smut plant will starve, and the cereal that starts afterwards will escape the enemy. If the wheat, &c., is pickled in solution of bluestone the spores will be killed, but the grain will live and grow.

Time after time it has been remarked in this *Journal* that the red wheats—or the so-called "flinty" varieties—sell in the British markets at higher prices than the soft white sorts. The flinty wheats are more prolific, more rust resistant, and give a better quality of flour than many of the soft white kinds.

Efforts are being made to cross the more valuable red varieties of wheat with the white sorts, by which it is hoped to secure all the good qualities of the first combined with the light color and softness of the latter. But why not grow the red wheat in the meantime? If local dealers refuse to pay full rates for such wheat, why not send it through the Farmers' Union to Great Britain, where the higher prices are given for red wheat?

Owners of dairy cattle should not neglect to grow some food for them. Mangolds and sugar beets are very useful; so also are kohlrabi, swedes, turnips, and cabbages and kails, but the four latter must be given with discretion. Land for beets and mangolds ought to be deeply ploughed and heavily manured as early in the season as is possible—directly the first heavy rains occur; but the seed should not be sown until about August—till October in later districts. Sugar beets are best for cows, and are most suitable on the shallower soils. Globe mangolds can be grown on rather shallow soils, where the larger kinds would fail. Kohlrabi, turnips, swedes, cabbages, and kails should be sown now. The cabbages and kails should be raised in nursery beds and be planted out when the rain has soaked into the soil.

On sandy soils some sand lucern (*Medicago media*) should be tried. In localities where the night frosts are not early or severe the common lucern (*Medicago sativa*) might be tried. Several farmers have been successful in establishing lucern paddocks by sowing about 6lbs. of seed on a field that has already been seeded for a wheat crop. The field should be very level and worked down fine, then sown with wheat and rolled; next drill on about 6lbs. of seed half an inch deep, harrow over with brushed harrows, and roll again. When both wheat and lucern plants are up it will benefit the plants to give them a light harrowing. A few plants may be destroyed, but the rest will be invigorated. Where night frosts are strong it will be best to delay sowing until end of September. In the meantime plough and pulverise deeply, make the field level, and manure with kainit and Thomas phosphate or bonedust.

The soil in every field contains more or less of each of the substances required for the production of a crop, whatever that crop may be. Some of those substances require time to be made available for plants, and only a portion of such substances is available in any one year; but there must be sufficient of each required substance for the season's crop. If 50lbs. potash, for instance, were needed to produce 20 tons of mangolds and there were only 25lbs. potash available there would be no possibility of getting the 20 tons of mangolds. For wheat crops, at present, there is usually a sufficiency of potash and nitrogen in the soils here, but not enough of phosphoric acid; therefore we supply phosphatic fertilisers. But the phosphates enable the plants to use up more potash and nitrogen in the much larger crops produced, and, of course, in time there will be less potash and nitrogen in the soil; and, unless these necessary articles are supplied, there cannot be full crops produced. But phosphatic manures do not impoverish the soil, but the larger crops removed from the land through the supply of phosphate decrease the stores of potash and nitrogen in the soil.

Large-framed Merino ewes from an enclosed run crossed with a pure Shropshire ram should produce good early lambs for export. But it is of no use breeding lambs unless food is provided for them as well as for the ewes. The farmer who has good stores of ensilage can work on a certainty, either for export lambs or for dairy products. Store pigs can be raised on ensilage and green feed, and, when topped up with meal and milk, cost very little for their rearing. With a pit of ensilage and a stack of good straw a farmer will be enabled in keeping more stock on his place than he would be without it. Sow simple crops of seeds to provide a crop for filling ensilage pits. Buy ewes for Drilling in lambs; do not try to breed them for that purpose unless the pur-

chased animals would have to be travelled too far. Sow some turnips, kohlrabi, cabbage, kail, &c., for feed for them.

Peas may not always pay in the crop of pulse they yield, but the pea straw is a valuable asset on the farm where animals are kept, and the crop itself benefits and enriches the soil in respect to nitrogen, which is very costly if purchased. Where pigs are kept the peas and straw can be stacked near the pig yards, and they will do their own thrashing. Sheep will pick up every pea on the field, and the poultry will get fat where they can find the seed. Drill in $1\frac{1}{2}$ bush. of peas per acre on well-prepared land in rows 18 in. apart, then roll and run a light harrow across the rows.

Broad beans should be in rows 3 ft. apart. Two bushels of seed per acre will be sufficient. The tick bean does not appear to do well in this State, but good crops are obtained from garden varieties. The beans are useful either for the table or the manger, and the straw, if crushed, is liked by horses and cattle. Beans should be cracked when used for feeding stock.

Amongst the other crops that should be sown during May are oats, barley, rye, rape, mustard, tares, vetches, clovers, grass seeds, linseed, cow cabbage, kail, poppy, carrots, turnips, kohlrabi, parsnips, and a few beets and man-golds.

Quite a large number of farmers and graziers are using superphosphates on their grazing pastures, with a view to improvement of the herbage. Others are experimenting on a small scale, with a view to more extended application if proved to be desirable. It is advised that these progressive people should also sow and cover in some way a selection of grass and other seeds suitable to their particular localities and conditions; because it is hardly possible that there can be too great a variety of palatable and nutritious grasses and herbs in any one pasturage.

WATERING HORSES.

The following advice about watering a horse is given by the *Agricultural World*:—"It has been found that a horse drinks less water in a given time if he has continual access to water in the stable than when watered at long intervals; and nothing can be said against this practice, except that the water is apt to become stale and foul by absorbing the ammonia generated from the urine, unless constantly changed. A horse should always be allowed to quench his thirst after coming in from work, even if he is hot. A very general opinion exists that it is injurious to water horses when they come in from work in a heated state, and they are, therefore, in many instances, not watered until they have somewhat cooled down; this opinion is fallacious, as it does not hurt horses to drink cold water directly they return from work. It is, however, hurtful to let a horse drink after he is partly cooled down, and this practice is very liable to cause a chill to the system. It may often be noticed that horses that have come in hot, and are not watered directly, but some time afterwards, commence to shiver after drinking a pailful of water, whereas if a horse is allowed to drink before the blood has cooled down he will not do so. The explanation of this is, no doubt, as follows:—Cold water, on entering the body, absorbs a certain amount of heat from the system, in order to bring its temperature up to the internal temperature of the animal drinking it. In the case of a horse in a hot state the loss of heat is not felt, as there is sufficient heat to spare; whereas in a horse which has already partly cooled down, and whose system has begun to flag, the sudden further loss of heat, occasioned by the cold water entering the body and absorbing heat, causes the system to become chilled."

SOUND HORSES AND HOW TO BREED THEM.

Dr. F. L. Clunes, M.R.C.V.S., gave an address on the above subject before an influential meeting of British agriculturists not long ago. He said the first essential to rearing sound stock was to start with sound parents. Dealing with hereditary unsoundness to be avoided he specified cataract, roaring, splint, ringbone, sidebones, navicular disease, spavins, stringhalt, and shivering, curbs, and sandcracks. The most particular thing in breeding was to have good feet, because they could always put the top of a horse on them. One of the causes of unsoundness in England was that anybody was allowed to travel with a stallion without a certificate, whereas on the Continent travelling stallions had to be examined every year by veterinary surgeons. To get sound, healthy stock they must breed from young mares, and it had been amply proved that if they wanted size they must have it in the mare. Defects in a mare should not exist in a stallion also, or the colt would possess them in an exaggerated form. If the mare had small feet the stallion should have good big feet. The question of shape must be considered as well as unsoundness, because it did not follow that because a horse was sound he was good looking. What was wanted in any kind of horse was a square animal, like a billiard table, with a leg at each corner. He did not think soil and situation made much difference, but the best land was that on limestone. It was a great mistake to have too many mares breeding on any farm, because it was well proved that after a few years the stock began to get smaller, and the constitutions of the animals weaker. He next dealt with the care of mares, treatment in foaling, the diseases of foals, and causes of unsoundness in perfectly sound colts, due to carelessness of the owner, breaker, or waggoner. Horses should not be worked too soon. If colts were allowed to run twelve months longer very often a much greater value would be obtained for them. He considered the breeding of big harness horses to be the most remunerative branch of breeding. He regarded the Hackney stallion as absolutely the best horse living. It was a better bred horse than any thoroughbred in England now. In the discussion which followed the chairman (Mr. James) said some people believed in Hackneys and some in thoroughbreds, but he thought they did best in getting a little bit of each. He thought it paid in the long run to stick to cart horses and general-purpose horses. To breed good horses they must look at the pedigree, and see that they had been sound for generations.

CAUSTIC LYE FOR DIPPING PLUMS—One pound Greenbank's caustic potash (98 per cent.) in 20 galls. water. Place the plums (fully ripe) in a wire basket, dip in the boiling lye about 5secs., then rinse in pure cold water, and spread the plums on trays to dry.

MACARONI WHEATS.—Macaroni wheats differ radically from the ordinary bread wheats, and in the field look more like barley than wheat. The heads are flat, compressed, and bearded, the beard often being black; the chaff is usually golden yellow, but sometimes black; and the grains are large, hard, yellowish-white, and clear, or, in wheats of the best quality, sometimes translucent. There are also occasionally velvet chaff varieties. In Europe they are known simply as hard wheats or durum wheats. The grain is much harder than that of the hardest bread wheats, and in the best varieties contains an unusual amount of nitrogen and a correspondingly small amount of starch. The quantity and quality of the gluten makes them exceedingly valuable for making macaroni. They are extremely resistant to drought, and resist the attacks of leaf rust and smuts to an unusual degree. On the other hand, they they will not withstand hard winters.

POULTRY NOTES.

BY D. F. LAURIE.

NOTE.—Letters of inquiry, &c., should be addressed to me, c/o Engineer-in-Chief's Office, Adelaide, enclosing stamped envelope if reply required.

Our Exports of Eggs and Poultry.

From time to time reference has been made to the exports of this and adjoining States, and particulars of the needs of other countries have also been furnished. In view of the importance of the poultry industry, and the general ignorance and apathy displayed concerning it, I have obtained certain particulars which will prove of much interest to readers. I noticed a letter in one of the dailies stated that as "they would have to purchase all the food for their poultry there would be no profit." These opinions are, unfortunately, held by a number of people, and they are true in a sense—that is, some people are so lacking in common sense, method, and cleanliness that whatever they undertake ends in failure. Thousands of industrious people here and elsewhere have proved that an excellent profit can be derived from poultry after buying all the food required, and that of the best quality only.

The following tables of exports of eggs and poultry were kindly furnished me by the Collector of Customs, and I am sure all will appreciate the value of the precise information therein given:—

RETURN SHOWING VALUE OF EGGS AND POULTRY EXPORTED DURING YEARS 1897 TO 1901.**Eggs.**

Year.	To Victoria.	To N.S. Wales.	To Western Australia.	To Natal.	To Cape Colony.	Total.
	£	£	£	£	£	£
1897	409	9,719	39,906	—	—	50,034
1898	478	9,925	45,299	17	—	55,719
1899	531	12,373	49,374	—	15	62,493
1900	89	15,679	56,604	1,094	213	73,679
1901	4,156	14,035	53,980	1,030	319	73,520
	£5,663	£61,931	£245,163	£2,141	£547	£315,445

Poultry.

Year.	To Victoria.	To N.S. Wales.	To Western Australia.	To Northern Territory.	To Queensland.	To United Kingdom.	Total.
	£	£	£	£	£	£	£
1897	—	—	—	—	—	—	No record.
1898	38	1,557	399	—	5	3	2,002
1899	—	2,377	406	—	—	—	2,783
1900	4	3,274	113	—	—	—	3,391
1901	2	1,613	944	5	—	—	2,564
	£44	£8,821	£1,862	£5	£5	£3	£10,740

Grand total for five years, £326,185.

It will be noticed that both Victoria and New South Wales are importers of our eggs, and it must be remembered that in the New South Wales return the Broken Hill trade is included. We also know that both these States export a

considerable quantity of eggs as well as poultry; their export of eggs and the import of eggs from South Australia seem peculiar, but I am informed on excellent authority that our eggs on reaching their destination take the place of local eggs, which can be gathered quickly and so exported in good order. Our eastern brethren in this way do part of our export trade in eggs for us. The South African market is difficult to reach, owing to the comparatively few boats which go from Port Adelaide thither as compared with the other States.

The export trade in eggs from Victoria is likely to increase largely, owing to the success of the Stiles patent process of preservation, of which I have heard glowing accounts. This will increase the demand for our eggs. Probably the average price of eggs will increase in the near future, as the various processes of preservation, including cold storage, will put an end to prohibitive prices in times of scarcity; at the same time there will be no need to glut the markets in times of plenty. We know that eggs can be kept for a great many months by modern methods, at the end of which they are perfectly fresh and palatable. We also know that frozen poultry, if properly treated, is equal to and in many cases better than fresh. Advantage of this fact is taken in England, where huge quantities are stored against better prices. Yet we hear random statements about the inferiority of frozen meat, made by interested persons, and only the easily gulled will fail to detect the cloven hoof of self-interest.

In addition to the official information given, I wrote to several firms connected with the trade; for some reason I got no answers, with the notable exception of Messrs. A. W. Sandford & Co., to whom I am indebted for valuable information such as will prove of great service to readers.

In regard to the values of our exports of eggs, Messrs. Sandford & Co. write:—"As the declared value, however, will in many instances include packages, cost of material and packing, if you will take the average value during the past three years as at 10½d. per dozen f.o.b., packages and material included, you will obtain a very close approximation to the number of dozens. Our largest export trade of late years has been to West Australia, though Sydney formerly received considerable quantities before the developments on the Western goldfields, and the trade with New South Wales is again likely to increase. Eggs are also sent from here to Melbourne now and again, and during the last couple of years a growing trade has been developed with South Africa, but which must be looked upon as only likely to be temporary, though it may last for a few years after the war closes."

The methods employed in collecting eggs for sale in the city, or for export, formed part of my inquiry, and the firm replied as follows:—"Eggs are delivered usually weekly by poultry keepers to country storekeepers, or packed on to the markets in Adelaide, or from northern districts to such places as Broken Hill, Port Pirie, &c. Collectors also travel through districts from farm to farm, selling goods and taking produce, including eggs, in return. These collectors forward to market or shipping ports, generally once or twice a week."

It is very evident that there are undue delays which, while they cannot be avoided, might still be lessened. We know that people will hold the eggs for better prices, and consequently such eggs may be stale before gathered by the collectors. Very probably if such eggs were rejected, the collector would lose the owner's future custom, and still these stale eggs would get into commerce through another channel.

By following my advice about keeping hens without male birds, a great improvement could be made, as infertile eggs keep much better than those which are fertile and liable to germination if exposed to high temperatures. At present anything in the shape of an egg seems good enough, but it is to be hoped competition will make our producers a little more careful.

I have heard woeful accounts of breakages of eggs consigned to Adelaide markets, and have also inspected some wretched examples of packing. Any old rotten box and musty chaff are deemed good enough by some people, and all they deserve is a poor return. I am surprised to find the percentage of losses through breakage so small as stated by Messrs. Sandford & Co., who write:—"In packing, carting to railway station, and the several handlings of eggs, a probable 5 per cent. breakage occurs. This could be mostly avoided by using greater care, and packing in frames such as the Lima egg case, against which, however, there is the first cost of the package, the tear and wear, expense of returning the case and frames to and from their destination (the cost of which seems to prevent country people using these packages freely), and it is doubtful whether by their adoption very much would be gained. We would suggest impressing upon those sending eggs to market to handle carefully, pack firmly in husks, and not let the shell of the egg be within an inch or two of the wood; when handling, to gently rattle the eggs, by which they would soon be able to detect quickly any egg that was even invisibly cracked, and keep these for home use. Exporters will not at any price take chipped eggs, as they quickly go bad during transit, and often destroy considerable quantities of sound eggs packed in their vicinity. These chipped eggs are taken out and sold usually at half price at Adelaide market; therefore it would be better to keep them on the farm." In other parts of the world the greatest attention is paid to freshness, grading, and packing; and it is found that reliable brands realise higher prices. Several correspondents noted the facts published by me some time ago of the exports from Russia to England of canned albumen and yolks, and on this point and for their information Messrs. Sandford report, in reference to the prospects of a trade, local or otherwise, in such canned yolks:—"As eggs are more generally useful, and therefore more valuable in the shell than when packed in liquid condition on Australasian and contiguous markets, which are likely for years to take all supplies raised, even after allowing for steady increase, there does not seem much to be gained in the endeavor to open up markets for albumen or egg yolks. In connection with this it is not yet generally realised that the new federal duty of 6d. per dozen will, by closing the Australian Commonwealth against outside supplies, probably retard the development of an export trade by some years. In justification of this opinion we would point to the fact that during recent years New South Wales, as a free port, annually received considerable quantities of eggs from China, Malayan Peninsula, and islands in the South Seas, which the 6d. duty must to some extent, if not entirely, prohibit." From the foregoing it will be seen that we now do an excellent trade in eggs and a moderate one in poultry; we have unlimited outlets for all the eggs and poultry we can produce. As regards table poultry we shall in time export largely to England, as is the case in other States; but first of all our breeders must produce sufficient birds of good quality, and to do this they must improve their stock, not by buying cast-off cheap rubbish, but by good stock birds, not necessarily show birds. On this point I may say for the benefit of anyone writing to me for information that good birds have their value, and I cannot get any for the price of rubbish; and as regards useless cheap so-called pure breeds, I will have nothing to do with them. There should be a strong move towards improving both the laying and table qualities of our poultry if advantage is to be taken of our excellent trade, which quite eclipses in value many which are more prominently before the public.

New Zealand is exporting poultry at the rate of 20,000 head a month, and Victoria is also doing so largely. I have a letter from Mr. G. Bradshaw, expert to the Board of Exports, Sydney, who writes:—"Everything in any way connected with poultry is booming; we are preparing 1,500 head per day for

export, and have forty-two people working at the industry; and large as the supply is, the demand is as great. For the three months ending March 31st of this year we have shipped 46,000 head; last year's shipments being 74,000 odd. Our greatest difficulty is in getting qualified pluckers; however, I am teaching a number. We are paying £60 per week rent, £80 wages, and £20 for cases, and still make it pay, although we will not freeze meat, pork, or mutton, only fowls, hares, rabbits, and sundries."

There is no reason why we should not do a far greater export trade in a few years when enterprising people are to the fore. An Adelaide firm informed me that they found the export of poultry did not pay. How is it that several English firms keep a buyer in both Melbourne and Sydney, and also why do Melbourne and Sydney exporters strive to increase their trade? The fault is largely that we have so few suitable birds for export, and probably there are other matters not as they should be.

Poultry Diseases, No. 6.

EGGS AND EGG PASSAGE.

EGG-BOUND.—When a hen is unable to lay her egg it is due either to temporary derangement of the oviduct or to abnormal size of egg, and in some cases to malformation. As a rule the hen remains for a lengthened period on the nest, or mopes round, stopping every few minutes in her endeavors to obtain relief. Fomentations with hot water applied to the vent, the administration of a tablespoonful of warm treacle, or passing an oiled feather into the egg-passage are to be recommended. In case of doubt, a careful exploration with the forefinger should be made, and if the egg is detected and unbroken an ounce of warm salad oil should be carefully injected. When relief is obtained and the egg passed, administer an aperient; and if the hen is too fat feed sparingly. In case of a broken egg the treatment will be found later on, under "Inflammation of the Oviduct."

EGG-EATING is a vice which in time becomes a disease, and often a whole flock will become confirmed egg-eaters. Several remedies have been recommended, such as patent nests so constructed that the egg when laid rolls down an incline and then down another at the opposite angle. A good method, where whole flocks are sinning, is to give them a plentiful supply of thoroughly rotten eggs to eat; this, as a rule, sickens them. Individuals, if not valuable, may be decapitated. Provide shell-forming material, bone, &c., and occasionally animal food, and refrain from the silly practice of throwing eggshells into the yards; these should always be crushed finely and scattered.

EGG-PASSAGE OR OVIDUCT, INFLAMMATION OF.—This is a common disease among poultry, and is often brought about by the use of irritating stimulants and patent nostrums. It is often due to the inflammation caused by the passage and presence of a broken egg; occasionally scrofulous deposits or external injuries are to blame. Whenever the eggs have a rough, harsh, limy appearance inflammation may be suspected. Mr. W. B. Tegetmeier locates the seat of the inflammation as follows:—"If the lower part is unduly excited the egg is expelled before the shell has been secreted, and a soft-skinned egg results. If the inflammation extends to the middle portion the membrane is either mis-shapen or incomplete; and if the whole tube is inflamed the yolks are dropped without any covering whatever." I have, as a rule, found the whole duct inflamed and much enlarged, and I believe the majority of observers report similarly. Affected birds naturally suffer severely, and the continual straining often results in apoplexy. The wings droop, and the feathers are puffed out; there is great heat at the vent, a temperature of 106° to 108° being known. In due time the constant straining produces exhaustion, collapse, and finally convulsive movements ending in death. When a broken egg is the cause, the administration of

internal remedies is of no avail. Frequent injections of warm oil and the introduction of the finger or small pair of forceps, and the gentle and gradual withdrawal of the broken egg should be essayed. When this is effected, and careful examination reveals no shreds or particles of shell, the passage should be syringed out with warm oil to which a few drops of pure carbolic acid (No. 1) may be added. Give twenty grains of sulphate of magnesia as cooling medicine every six hours.

EGG PASSAGE, PROTRUSION OF, is usually met with in over-fed or old birds, and is also due to constipation, relaxation of the parts, or the after effects of expelling a large egg. Treatment: The protrusion should be carefully cleansed in warm water and gently returned; then the application of an astringent is recommended, such as a weak solution of alum, chloride of zinc, vinegar and water, permanganate of potash. Check laying for some time until the parts have regained tone. Give daily a pill containing a grain each of tartar emetic and opium, and two grains of calomel.

EGGS, SANGUINEOUS.—There is occasionally a spot of blood found in an egg, and this gives rise to the belief that the egg has been partially incubated. The blood is due as a rule to hemorrhage from the germ vesicle, and occasionally to testicular disease of the male, or ovarian disease in the hen. The first-named cause may be directly traced to immoderate use of too stimulating food.

EGGS, SOFT SHELLED, are generally due to absence of shell-forming material. Forced birds are often sufferers; while an accumulation of internal fat so presses on the organs as to derange them. A sudden fright will cause the premature expulsion of an egg, and thus may end in inflammation of the duct. Treatment: Avoid the foregoing causes; give an aperient, and then ten grains of sulphur and one of calomel and Douglas mixture in the water. An over-vigorous male bird in a small pen may cause this trouble also.

ENTERITIS (OR INFLAMMATION OF THE BOWELS).—This is, as a rule, due to a continued course of stimulating food, overfeeding, the presence of acrid or poisonous substances in the intestines. Intestinal worms in numbers cause similar symptoms, and of course the eating of poisons or irritants, such as quicklime, is a prolific cause. Irresponsible persons are prone to advocate the free scattering of unslaked lime, which, if eaten, as it generally is, by the birds, sets up violent irritation and corrosion. There is generally moping, loss of appetite, great thirst, constipation, quickened breathing, and, later, drooping wings, ruffled plumage, and prostration. Treatment: Give a grain each of opium and calomel occasionally, after first giving a little salad oil and injecting same *per rectum*. Should worms be suspected, treat as directed under that heading. The drinking water should be boiled, and to each quart add a teaspoonful of sulpho-carbolate of zinc. Give bread and milk as sole diet until convalescent.

FOREST PLANTING AND TIMBER SUPPLY.

By F. E. H. W. KRICHAUFF.

No. 6.—Artificial Manure for Forest Nurseries and Forests.

Of late a large number of experiments have been made all over Germany. The mere extra cost of perhaps 10f. per acre by applying phosphoric acid and potash, and (where no green manuring took place) of a nitrogenous manure should not be a very deterring item even here, with the limited number of acres that are likely to be planted. D. F. Giersberg, of Berlin, has collected the results of many of these experiments, which I will hereafter mention. Few may know that Baron J. von Liebig advocated the manuring of forest nurseries, and expected also that not merely agriculture, but, to some extent, forests

would derive great benefit from his theory of mineral manures. Pines only 3in. or 4in. long send their roots frequently to a depth of two or more feet; which shows that the subsoil must supplement what the surface soil cannot furnish. He admits, however, that trees require less manuring when they are reaching the subsoil at greater depth, and find through the dissolution of rocks a larger supply of plant food than in the surface soil where such decomposition, through the greater influence of air and rain, has been carried on for unknown ages.

In 1869 nursery plots of forest trees were fertilised in Holstein, first with Peruvian guano, and afterwards also with other commercial manures, on a small scale in the forests themselves. After 1880 more nurseries were fertilised at Metz, Eberswalde, Dobrilugk, and Kaisersberg. In Belgium large portions of forests were also thus treated. Associations for cultivating the heaths in Denmark and in Schleswig-Holstein had the very best results with fertilising their nurseries, and from that time the use of fertilisers became more general in nurseries, although there were not a few who condemned the practice. The objection was, however, one which had soon to be dropped, for it was proved that trees raised in these nurseries made much better growth after transplantation, when compared with those which had purposely been raised in unmanured soil. I admit that I was formerly of opinion that it was preferable to obtain fruit trees from a nursery which had a poorer soil than my own. Photos. taken of trees of the same age have now convinced me that the increased number and the larger roots produced in fertilised nurseries give the young trees a better chance, and Dr. Smets says in his pamphlet "*La culture du Pin sylvestre en Campine*"—"If you sow as usual pines in a nursery with poor soil, you can only obtain sickly plants without any future." M. Martinet also states: "It is an erroneous opinion that young plants should be acclimatised and made hardier, so that, if intended for poor soil, they will be satisfied with the local position and soil. Pines of one or two years draw from the soil of a nursery from 24lbs. to 28lbs. of potash per acre, from 20lbs. to 24lbs. of phosphoric acid, from 60lbs. to 64lbs. of lime, from 16lbs. to 20lbs. of magnesia, and from 56lbs. to 64lbs. of nitrogen, and it becomes true that after the removal of the seedlings from the nursery, its soil is that impoverished that mere stable dung, compost, and green manuring is not sufficient to again raise strong seedlings. And yet seed beds in the nurseries cannot be shifted, but must be used again and again." Professor Dr. Goetting shows by means of photos. that larger quantities of fertilisers per acre gave remarkably larger pines. He used in one instance 640lbs. of Thomas phosphate and also of kainit; in another twice as much. Mr. Dalgas, the cultivator employed by the association for planting on the Danish heaths, actually recommends to use five to ten times as much potash, and four to six times as much phosphoric acid as a real necessity for the plants. At the same time it is well to mention that in not a few instances the application of the fertilisers, not their use, was quite wrong, where results did not come up to expectations. You might put into the hole into which a tree is to be planted a handful of a fertiliser consisting of six parts of guano, three of Thomas phosphate, and fifteen of kainit, but this must be well mixed with the soil. If this is omitted, you might lose within a few weeks 90 per cent. of the trees. All the smaller roots would be destroyed. Although it is preferable to mix the Thomas phosphate a week or two before planting with the soil, but the kainit should not be used less than three months before. Mr. Forester Hallbauer recommends the same course when sulphate of ammonia is to be used. Professor Dr. Schwappoch, of the Forestry School at Eberswalde, recommends 320lbs. of Thomas phosphate, 160lbs. of 40 per cent. kainit (or about 500lbs. of kainit), and 80lbs. of nitrate of soda per acre. In the big heath of Lüneburg, Hanover, the ground is ploughed in autumn,

and receives 10cwts. of lime to quicken dissolution of the heath. Lupins are then sown in spring, with 6cwts. of kainit, 2cwts. of Thomas phosphate, and, after ploughing them in, the pine seeds are sown in straight furrows. Green manuring with leguminosæ is very advisable where nitrogen and humus is wanted in the soil. Even hard and pebbly subsoil can be penetrated by them, and especially by lupins, to a depth of 3ft. Subsequent crops can therefore receive from such a depth the moisture by means of openings which the dead roots have left. And this is not the only advantage which green manuring has over stable dung. The cost of the latter in some cases, and of its carting and spreading, is probably quite three times greater. Where green manuring was applied on sandy soil of the eighth class, a good crop of peas gave no less than 180lbs. of nitrogen per acre, equal to 11cwts. of nitrate of soda. Green manuring is therefore much carried on in forests of late years.

Dr. Giersberg recommends for nurseries of forest trees to use from 640lbs. to 800lbs. of Thomas phosphate and as much of kainit, the latter applied long before the sowing of the seeds for green manuring, and this should be ploughed in when in full bloom and the first pods formed. Where no green manuring is intended the nitrate of soda should be applied between the rows, either in one or two doses, according to the quantity which seems needful, viz., from 80lbs. to 160lbs. per acre.

Next to nitrogen the seedlings contain much lime, and nurseries should, therefore, not be without sufficient lime, the more so as it has also the task to decompose the organic and mineral constituents of the soil by quickening nitrification and improving the physical condition, especially in heavier soils or where there is sour humus. For very sandy soil marl is preferable to lime, by making the sand more binding and it holds more water. From ten to twenty loads of marl of 2,000lbs. each may be needed. Where Thomas phosphate is applied, which contains up to 50 per cent. of lime, no special liming is required. It is advisable to put a portion of the Thomas phosphate into the subsoil, and before or after planting to put another portion into or on the surface soil. At the cultivation of heath nurseries the ground is dug at least 13in. deep in autumn, and receives 640lbs. kainit and 400lbs. Thomas phosphate of 17 per cent. per acre. In May 200lbs. of lupins are sown and ploughed under as soon as the first pods set, with 1,200lbs. kainit and 800lbs. Thomas phosphate again applied. It seems too much to actually use 1,840lbs. kainit and 1,200lbs. Thomas phosphate; but when 3,200lbs. of each was applied the seedlings thrive excellently and were certainly not damaged. Frequently some nitrate of soda is yet given to the extent of 160lbs. per acre, as top dressing later on, and even another dose.

That it will pay to use commercial manures for forests can hardly be doubted, when it is considered that 1lb. of nitrogen is sufficient to produce from 125lbs. to 200lbs. of dry wood, 1lb. of potash to 3,300lbs. and 1lb. of phosphoric acid to 5,000lbs. Where green manuring is not likely to succeed of course more nitrate of soda must be given, but the poorer the soil is in humus the more desirable it is to enrich the land with it in some way.

Dr. Giersberg recommends for the necessary potash to be used in nurseries the 40 per cent. kainit (100lbs. = 80lbs. of 80 per cent. muriate of potash). As this salt is not yet exported, common kainit containing only 12.5 potash must be used, and to prevent any damage likely to occur from the large proportion of sodium chloride, and perhaps other salts combined with it, it should be used long before the sowing of the seeds. In very dry positions, however, the use of common kainit may be of advantage, on account of the hygroscopic nature of the sodium chloride.

Apparently Belgium is in advance of all other countries in the use of large quantities of fertilisers for forests; 16in. to 18in. is the usual depth of ploughing

for planting, and if a subsoil plough can be used 2ft. 4in. to 2ft. 6in. is not unusual. Large tracts of desert country are thus planted, and to do this at the smallest expense rye and other crops are raised for some years between the rows when the young trees are. Green manuring, mostly with lupins, liming, potash, and phosphoric acid are required for improving the surface soil sufficiently before planting them, which then are expected to grow well for ten or fifteen years, after which time the roots are likely to find sufficient nourishment in the deeper subsoil, where, after many experiments made by Professor Dr. Wohltmann there and elsewhere, in most instances large stores of mineral fertilisers are to be found. Dr. Jentsch, of the Forestry Academy of Hannover-Münden, says, "Farmers see the result after using fertilisers within a year or two, while the forester has to await them after many decennia, and the final decision must be delayed for as long a term." The experiments are very encouraging, but more time must elapse to decide whether no further fertilising is required—whenever pines, for instance, show at a certain age a stoppage in their growth, which frequently occurs.

In many forests very large doses of fertilisers have been given to single trees. In Eberswalde, in a forest of pines seventy years old, but poor, 800lbs. of Thomas phosphate, 800lbs. of kainit, and 160lbs. of nitrate of soda per acre have been used; and, where the same quantities were used at Hadamar, after oaks eighty years old had been felled, and pines (with a view of being sheltered by the stumps) were sown, the piece which had received the fertilisers showed during the summer up to thirty young shoots up to 6ft. long on the stumps of the oaks, while these were only 2ft. or 3ft. long on the unmanured land. It seems also certain that after felling trees there is in most cases a difficulty in getting young trees to grow to advantage without giving them a covering of humus. Fifteen-year-old pines, quite starved, only 1ft. 8in. high, and shooting only 2in. annually, were three years ago mulched with horsedung, and in the next year the pines showed a fine green color, and the average annual shoots are since more than 1ft. long. Mulching with potato leaves or other material had not quite so good a result. The annual shoots averaged 8in., thus showing that it was not mulching alone but the nourishing constituents in the manure which caused the extra good growth.

Lately I received the report for 1900 from British Columbia, a country which has still enormous virgin forests, where Douglas firs can be found 11ft. in diameter, with barrels 150ft. long and more perfectly clear of branches. Fancy trees of many kinds, frequently of prodigious size, so close together that it is with difficulty and often impossible for an animal to pass between, with limbs only at the top through which the rays of the sun can scarcely penetrate at all, the ground carpeted with mosses and ferns and such timber resources for several hundred miles north of the United States boundary, which on an average may cut easily 50,000ft. per acre, in fact sometimes 500,000ft.; and yet it is estimated that these forests will be worked out in sixty years. Bush fires will destroy 50 per cent., and the output increases so rapidly, especially since the making of pulp for paper, that this is very likely, and a rejuvenation of the forests is not probable when for the last purpose trees down to 6in. at the stump are cut. And over the border, in the United States, Mr. H. B. Ami, of the Dominion Geological Department, says that now only poor depauperated forests are left.

Is it not time to bestir ourselves?

SORE TEATS.—Melt together 1oz. yellow wax and 3ozs. lard; when it begins to cool, rub in ½oz. of sugar of lead and 1dram. of powdered alum. Apply this to the teats, after washing and drying. Vaseline is also very good. These should be washed off before milking.

ONION NOTES.

[Experiment Station, Manhattan, Kansas.]

Onions may be grown on any soil, yet for onions, as for other crops, there are soils that are better than others. The best soil is a rich, sandy loam, as free as possible from weeds. A well-cultivated field of sandy loam that has been well manured with stable manure for several years will grow good onions. Onions should never be put in a soil that is foul or that has been too recently fertilised with barnyard manure, unless the manure has been well rotted.

Ground that is intended for onions this year should be ploughed very early in the spring and disced later. The ground should be well cultivated just before the onions are put on the land.

There are two methods of sowing seed. The old way was to sow in drills in the field as you would peas or other garden crops. After this the fight with the weeds was sure to disgust the cultivator of onions. In the end we had sacrificed many of the plants in trying to kill the weeds, and, of course, had a very poor stand of onions. During the past few years the cultivators of onions for commercial purposes have been growing their onions in hotbeds and then planting them out in the field. Some of the advantages of this method are: (a) The crop matures earlier; the seeds may be sown in the hotbeds in February; (b) the onion transplants with as much ease as any of the garden plants; (c) it materially increases the yield, because of the more even stand and because of the choice of the better seedlings for the row, where, if we allowed them to grow in drills, the stronger ones are liable to come up too near together to allow them to grow, and many of the best plants are destroyed while the weaker ones grow up where we want the stronger ones; (d) it does away with the task of weeding, thus making the production cheaper. By actual experimentation it has been found that the cost of maturing the crop when transplanted is somewhat less than when the seeds are sown in drills in the field.

The temperature of the hotbeds should be below 80° when the seeds are planted. When the seedlings are of a size to set out, which will be in about six weeks, the ground should be thoroughly cultivated so as to kill all the weeds that may be starting. The ground should then be laid off in rows 18in. to 20in. apart. Onions will stand a great deal of crowding, and some growers put them as close as 12in. When the plants are being removed from the hotbed the tops should be cut back. The plants are usually set 3in. apart in the row, with the lower end of the bulb about 1in. below the top of the ground. The transplanting may be done with an ordinary dibble. The cost of maturing an acre of onions in this manner is about 20dolls., including seeds, hotbeds, transplanting, and cultivation. The cost for an acre in drills is about the same.

The cultivating may be done with a horse or with a wheel hoe. For tending crops of this sort the Experiment Station has successfully used a wheel hoe with the onion hoe attachment. The advantage of using this implement is that the rows may be grown closer together. The increase in yield will increase the profits on a given area. The implement adopted to this sort of work is advertised by all dealers in garden tools, and costs from 4dolls. to 10dolls. No onion-raiser should be without one, as its knives run on each side of the row, and clean out all the weeds except those that are directly in the row with the onions.

It is not necessary that the tops be broken over for the crop to ripen. They will ripen almost as soon, and quite as well if they are left alone. In harvesting, the bulbs are pulled and thrown in windrows to lie in the sun a few days until the outside is dry, though they must not be allowed to sunburn. When

dry on the outside they are taken in and spread upon the floor of a barn or storeroom until thoroughly dry. An open building that will keep off the sun and will allow the circulation of air is best. A corn-crib is as good as anything. When dry, they are stored in boxes, barrels or burlap sacks. Some growers store them in layers 8in. to 10in. deep in a well-ventilated room. If the onions have not been properly dried and cured, it is necessary to sort them over very often, or, at least, to stir them to prevent heating. The storeroom should be kept dry and cool; if just above the freezing point, so much the better. Onions may be sorted much the same as potatoes, though care must be taken that they do not get bruised. A special form of vegetable sorter is generally used.

VEGETABLE-GROWING FOR AMATEURS.

BY W. L. SUMMERS, INSPECTOR OF FERTILISERS.

Two mistakes usually made by amateur growers of vegetables are overcrowding and insufficient cultivation. A few notes on the preparation of the land, quantity of seed to sow, distance apart to plant, and manures to use may be useful.

A rich loose loam is undoubtedly the best for vegetables; a light sandy soil, so long as it is not too poor, is very useful, and even a heavy soil will produce satisfactory results if properly treated. All land for vegetables should be thoroughly prepared, being broken to a depth of at least 1ft. Care must be taken that the subsoil is not brought to the surface. Heavy soils can be made more friable by giving a good dressing of quicklime; the more vegetable matter that can be turned under the better. For all crops a plentiful supply of humus is required. Humus is decayed vegetable or organic matter; it is not a direct plant food, but it may almost be termed the life of the soil. A plentiful supply of humus enables the plants to make use of the mineral matter in the soil; it has a marked effect on the moisture-retaining capacity of the soil and also on the texture and general condition. A soil deficient in humus, no matter how rich in mineral matters, is of little value. This is why stable manure is so essential to the market gardener. Where a supply of stable manure is not available quick-growing crops should be sown, and when there is a good growth of vegetation it should be dug under. The amateur grower should have a small pit into which all weeds, waste vegetable matter from the house, poultry droppings, and any other material that will decay can be put. House slops thrown on the heap occasionally will help to improve it, and if dry ashes, gypsum, or earth is scattered over it there will be no objectionable smell. A good compost heap of this character is invaluable.

In preparing the land for planting the surface should be made fine and mellow. With light soils this is not difficult, but some trouble and judgment are required in the treatment of heavier soils, as if cultivated when too wet or too dry the results will not be satisfactory. The grower must bear in mind that he cannot expect to grow two crops at the same time on the one piece of ground; therefore, unless the weeds are kept under control, the vegetables will suffer. The best way to prevent the weeds getting a hold is to use the hoe frequently; keeping the surface loose in this way also helps to retain the moisture and encourages rapid growth of the plants, as it mellows the soil and assists in rendering the plant food available.

In dealing with manures, as previously stated, farmyard manure is undoubtedly the best foundation, and though usually spoken of as a complete manure it can scarcely be called such, as it is badly balanced, the nitrogen and potash being considerably in excess of the phosphoric acid, whereas experience

has shown that for general purposes the reverse should be the case. To supply sufficient phosphoric acid by means of stable manure would be impossible under average conditions; it is therefore necessary that commercial manures should be used in addition. The following particulars concerning various manures, cost, and quantity to apply may be instructive:—

Bone Super., probably the best general commercial manure for vegetables, containing about 16 per cent. water-soluble phosphate out of a total of 35 per cent. of phosphate, and 2.5 per cent. nitrogen. For most crops this can be applied at rate of 1lb. to 2 square yards where very little stable manure is used, or half that amount where stable manure is used in any quantity. Cost, 5s. 3d. per hundredweight.

Bonedust contains from 3 per cent. to 4 per cent. nitrogen and 44 per cent. to 50 per cent. phosphate on the average. It is, however, not so quickly available as the super., as the bones must decompose in the soil before the plants can utilise the food in them; the finer it is ground therefore the quicker its action. If used, mineral super. or other forcing manure should also be applied. Cost, 5s. 6d. to 6s. per hundredweight.

Mineral Super. contains 36 per cent. to 38 per cent. water-soluble phosphate and is more forcing than either of the above. Where plenty of stable manure is applied it might pay better than either. It is also valuable as a top dressing after the plants are up. Cost, 4s. 6d. to 5s. per hundredweight. Use about same rate as bone super.

Thomas Phosphate contains 37 to 42 per cent. of phosphate, but is usually too slow to be profitable to the amateur. On stiff lands it is more useful on account of the lime it contains.

Lime may be used for sweetening and rendering the soil more friable. Put in small heaps, when the ground is comparatively dry, about 2yds. apart, 1lb. to 1½lbs. quicklime, cover with soil and allow to slack to a powder. Distribute it evenly over the soil and rake it in. It will be readily distributed in the soil by the moisture. Large quantities of lime may be used without any injury. Gypsum will have almost the same effect as quicklime, though not so rapid in its action, and is not so unpleasant to handle. It can be worked directly into the soil, as it does not require to be slacked.

Sulphate of Ammonia.—Nearly all our commercial growers use this fertiliser to force their crops to early maturity. With most kinds of vegetables quick growth means high-quality produce and profitable returns. For cabbages and cauliflowers apply a small quantity, about a teaspoonful, sprinkled round each plant and hoed in when they commence to make new leaves after transplanting and again about a month or six weeks later. For general purposes use about 1oz. to the square yard as a top dressing. Most gardeners prefer sulphate of ammonia to nitrate of soda, as they say the latter is more exhausting to the soil; but as the sulphate must be converted to nitrate in the soil before the plant can use it, there is no reasonable ground for this complaint. Nitrate is quicker in its action and with many crops gives the best results, but much depends upon the soil. As these two fertilisers are very readily soluble, it is better to give two light dressings than one heavy one. Sulphate of ammonia contains 20 per cent. nitrogen against 16 per cent. in nitrate, and at present prices is really the cheaper manure. Cost of manures, about 2d. per pound in quantities of 14lbs. These manures are always used in addition to one or other of the phosphate manures previously mentioned. To apply either to soil that is not fairly rich in other constituents will be distinctly unprofitable.

Dissolved Peruvian Guano.—This is a splendid manure for all vegetables, and can be applied as a top-dressing or dissolved in water. It contains about 4½ per cent. to 5 per cent. nitrogen, 2 per cent. potash, and 20 per cent. of water-soluble phosphate. It is, however, not much used here on account of

the high price, but some of our Chinese gardeners use it regularly and prefer it to any other fertiliser. Amateurs growing only small quantities of vegetables may find it the best to use, as a shilling or two extra in cost is neither here nor there. It should be applied at rate of about 2ozs. to 2½ozs. to the square yard. This manure costs about 2d. per pound in small quantities.

Potash.—This can be supplied when required in kainit (12 per cent. potash), sulphate of potash (50 per cent. potash), or muriate of potash (60 per cent. potash). The latter is the cheapest form of potash. Kainit contains 33½ per cent. of common salt and is particularly suitable to asparagus, mangolds, and a few others.

In applying manures broadcast the following figures may be useful :—

1oz.	to the square yard	represents	nearly 2½cwt. per acre.
2oz.	"	"	about 5½cwt. per acre.
4oz.	"	"	not quite 11cwt. per acre.
1lb.	"	"	a little over 2 tons 8cwt. per acre.

Liquid Manures.—Superphosphate, nitrate of soda, sulphate of ammonia, and Peruvian guano can be used with very satisfactory results as liquid manures. For outdoor work the following quantities :—Super., a heaped tablespoonful to 3galls. water; Peruvian guano, a heaped tablespoonful to 4galls.; sulphate of ammonia or nitrate of soda, a tablespoonful to 4galls. When using super. or guano in this way, stir the water several times before using to dissolve the manure and stir occasionally while using.

Quantity of Seed and Distances Apart.—The general failing with amateurs is thick sowing and consequent overcrowding. The following shows approximately the distances apart the plants of various vegetables usually grown by amateurs should be, also the area that given quantities of seed will sow. When the grower finds that the seeds are coming up too thickly he should not hesitate to thin out to the requisite distance apart. The variety, time of seeding, and class of soil all affect the quantity to sow and distance apart the plants should be :—

Broad Bean—4in. to 6in. apart in row; plant in double rows 9in. apart with 2ft. between each double row; a pint will be sufficient for about 50ft. of row.

French or Kidney Bean—3in. to 4in. apart; double rows 6in. apart and 18in. to 2ft. between rows; 1 pint will sow about 80ft.

Red Beet—6in. to 8in. apart; 12in. to 15in. between rows; 1oz. seed to about 60ft. row.

Brussels Sprouts—15in. to 18in. apart; 2ft. between rows; ½oz. seed enough plants for 100ft. row.

Cabbage and Cauliflower—18in. to 2ft. apart; 2½ft. to 3ft. between rows; ½oz. seed to 100ft. row.

Carrot—4in. to 6in. apart.; rows 9in. apart; ½oz. seed to 40ft. row.

Kohlrabi—8in. to 10in. apart; 18in. between rows; ½oz. seed 80ft. row.

Lettuce—8in. to 12in. apart; 18in. between rows; ½oz. seed to 125ft. row.

Parsnip—6in. apart; 12in. to 15in. between rows; ½oz. to 60ft. of row.

Peas—3in. apart; double rows 6in. apart and about 2ft. between each pair of rows; ½ pint will sow 50ft. row.

Onions—5in. to 8in. apart according to variety; 12in. between rows; ½oz. will provide enough plants for about 80ft. of row. For pickling sow broadcast and thin to 1½in. to 2in. apart.

Radish—about 2in. apart; ½oz. will sow 60ft. of row.

Turnip—3in. to 4in. apart; 9in. between rows; ½oz. seed to 60ft. row.

SELF-RAISING FLOUR.—Pulverise 8ozs. cream of tartar, 4ozs. carbonate of soda, and 1oz. tartaric acid, and thoroughly mix in 20lbs. flour. The mixture must be kept perfectly dry until wanted for use.

NOTES ON VEGETABLE-GROWING FOR MAY.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

On the plains most kinds of seasonable vegetables are making fair progress, though at the time of writing the irrigating appliances have not been completely dispensed with for the season.

All kinds of growing crops should be encouraged by a liberal use of the hoe or fork to keep the surface of the beds open and free of weeds. Light sprinklings of superphosphate or sulphate of ammonia will help growing crops.

Turnips may be helped along considerably by these means, but those deeper penetrating root crops, such as parsnips and carrots, tend to send out side fibres if treated in this manner.

Growing crops of turnips, swedes, carrots, parsnips, beets, lettuces, radishes, and spinach should be rigorously thinned as soon as they develop rough leaves.

Sowings of these may still be made with good hopes of success. The root crops invariably yield the best results when sown upon land which has been heavily manured a season or two previously. If such is not available trench the soil and place the manure in the bottom layer.

Make transplantings of cabbage, cauliflower, kohlrabi, Brussels sprouts, broccoli, celery, and onions whenever the plants are available.

Sowings of broad beans could be made, but it is of little use sowing peas now, as when the soil becomes wet and cold the plants refuse to grow, or if they grow the blooms fail to set pods.

Potatoes should be "hilled" up when the plants are about 6 in. high or the soil kept loose between the rows of plants. It is not advisable to set out potatoes now, as the frosts are almost sure to nip the tops before they mature.

The earthing up of celery stems to blanch the leaf stalks should be maintained from the time they become thoroughly established and growing. To avert the intrusion of soil, paper "collars" are sometimes placed around the folded leaf stalks. These plants thrive under a liquid manure treatment. Fresh cow manure or soot are often used for the purpose. They are placed in a bag and steeped in the liquid manure tank filled with water. Growing plants of peas should be staked from off the soil, to avoid decay and to permit the light to reach all of the blossoms.

Cut yellow stems away from asparagus plants, and topdress the beds with well-decomposed farmyard manure. A sprinkling of salt, say a full handful to the square yard, may also be given to such beds.

Rhubarb plants are going to rest, and no attempt should be made to cause them to grow at this juncture.

All dead vegetation should be rotted down in the compost heap during the winter.

SOME FACTS THAT ARE KNOWN ABOUT THE CODLIN MOTH.

The caterpillar of the codlin moth will hide in any dry warm place, enveloped in a silken cocoon, from the beginning of winter until the apple blossoms begin to break out. It then becomes a chrysalis, and after a short time emerges as a moth. This transformation occurs about the time the apples or pears or quinces are about the size of a small garden pea. But some of the moths do not appear until later, owing to being located in a cool or shaded place, so there is a continuous appearance of moths for some weeks.

Within a very short time after the female moth has emerged from her chrysalis stage she commences to lay eggs. Each egg is about the size of a small pin head, is rather flat, semi-transparent, so that the color of the leaf or fruit shows through. Generally one, but occasionally more, eggs are affixed either to the surface of each fruit, or sometimes on a leaf adjacent to a fruit. The minute caterpillar generally emerges from the egg within a week, but may be a little earlier or later, according to the warmth or coolness of the surroundings. Its first food is taken from the surface of the leaf or fruit on which it is located. At this period a very minute portion of arsenite of lime or other arsenious compound will kill the caterpillar; but if it once enters the fruit the poison cannot affect it, and the ultimate progeny may amount to many thousands during the season.

If the caterpillar escapes the poison (which should have been sprayed on the whole of the tree directly after the "leaves" have dropped off the flowers), it tunnels into the fruit, usually by way of the eye or calyx end, at the first part of the season; but later broods seem to enter anywhere, especially where two fruits touch each other or where a leaf lies close to the surface of the fruit. It remains in the fruit about three or four weeks, usually finishing its diet by devouring the pips, which would appear to be necessary to its full development and maturation. [Hence the probability that, if the codlin caterpillar should attack plums and other stone fruits, it would be unable to further propagate its species.]

When the pips of the fruit have been eaten it often happens that it falls from the tree, and the caterpillar leaves by a tunnel on the side and seeks a safe place in which to change into a chrysalis. But the fruit does not always fall, and the caterpillar then leaves by way of the aforesaid tunnel, lets itself down by means of a silken thread until it reaches a limb of the tree or gets to the ground. In either case it at once seeks a safe hiding place, makes a silken cocoon, and in a few days changes into a chrysalis, and then becomes a moth. From the time of leaving the fruit until the appearance of the moth only about three weeks elapses, and again the moth begins to deposit eggs on the fruit and leaves. The delayed moths, that resulted from caterpillars living over from last season, have also been producing caterpillars, so that it is next to impossible to know which at this time are first or second broods; but this is certain, that each matured caterpillar has spoiled at least one apple, pear, or quince.

It is almost certain that, in our warm and favorable climate, there are at least three generations or broods of codlin moths during the summer and autumn. Probably, owing to the cool evenings when the first moths of the season appear, they do not travel very far; but it is believed that the later broods of codlin moths may fly a mile or two on warm nights to find food for their future progeny.

The most rational system of dealing with the pests would be to prevent the first brood, and to do everything possible to trap and poison the following broods. During winter every harbor for the caterpillars should be examined; cracks, knotholes, old bark on trees, stakes, adjacent fences, large stones, &c., in the orchard will yield up more or less victims to such a search. Bandages should be left on the trees and be examined once a month during winter, because the pests will leave a place that appears to be too cold or damp or exposed, and take refuge in bandages on the trees. Fruit-rooms should be made moth proof, with a glazed window at one end, so that all moths that are hatched in the room shall be imprisoned, and when they fly to the window they will die there.

When the petals have fallen from the flowers of apple, pear, or quince trees the trees should at once be sprayed with arsenite of soda in limewater, and if rain should follow within two or three days the spraying should be repeated. It would be worth while to spray again at least twice, at intervals of twelve

days. Bandages should be affixed to the trunk of each tree, and be examined once a week. It would help to diminish the number of caterpillars if pieces of old newspapers were crumpled and placed in the main forks of the trees, then gathered once a week in baskets and burned. All fallen fruit, and as many as may be found attacked upon the tree, should be gathered, placed in bags, and submerged in water for at least forty-eight hours. It would be a great protection if no old cases were allowed to come back to the orchard; but if this cannot be avoided they should be submerged in scalding water, or steamed till all caterpillars are killed.

If the above precautions are adopted there will be very little damage from codlin moths. If every fruitgrower would adopt such measures the cost of protecting the fruit in any district would be reduced to a minimum.

It would be hardly necessary to mention the following facts were the nature and habits of the codlin moth better and more generally known. The codlin moth cannot be attracted by a light exposed in the orchard or elsewhere. It does not attack potatoes or tomatoes. The caterpillars in potatoes and tomatoes belong to two entirely different species of moths. The codlin moth caterpillar will hide in stringybark trees, posts, or anywhere, but does not feed upon the bark or any part of them. It has often been asserted that the caterpillars live upon stringybark trees—so they do in so far that they will hide there, and undergo their transformations, just as they would on a dry stone, an old coat, or in a cranny on an apple tree.

ORCHARD NOTES FOR MAY.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

The fruit harvest is now completed as far as deciduous kinds are concerned, and the orchardist has a short breathing space in which to consider the work of the past and outline work for the future. Truly the duties of the fruit-grower partake of a routine character, but they are not of such a monotonous nature as those of the toiler who does not deal with the ever-changing vital forces of nature.

No doubt at this period every careful orchardist looks over the results of the year's operations with a critical eye. The losses due to pests, meteorological disturbances, or unfavorable markets are dealt with alongside of the gains attributable to some improved method of working the orchard, or judgment displayed in selecting what to plant or when to market the produce. Although seasons will be irregular and markets erratic until the end, still upon such considerations alone can we count for progress.

The period of harvesting being past, the time to prepare for the crop of the coming year is at hand. The ground has become trodden by the busy feet of the harvester and his teams. The leaves fall to the soil and assist to return nourishment to the roots through the decomposition of their tissues, but the crops of fruit have been carried away, and the soil is thus left poorer in proportion.

Other things being equal, the chief considerations in our orchard work are the saving of moisture in the soil, and the maintenance of a high standard of fertility in the land carrying the fruit trees. Excepting where the trees are planted in soils too wet for successful fruit-growing, deficiency of soil moisture makes itself apparent in our orchards every year almost without exception.

We cannot increase the rainfall, and in most positions we cannot augment the volume of water upon any given piece of ground, but we can often utilise more fully to the advantage of our trees the rain which falls. Unless the soil

be of an exceptionally porous nature, the only practicable method of securing the even absorption of all the rain that falls upon it is found in making the surface rough early in the winter. Turned up no matter how roughly by means of plough, fork, or spade the rain penetrates to the subsoil in a manner quite unknown and impossible to the hard trampled surface. The deeper it penetrates the better. There are only two ordinary outlets. One is the free water beneath—the water level of the spring or well supply; the other is through the surface by evaporation. The loss by the first need not be considered; that from the latter may be reduced by subsequent tillage operations. In the processes of nature the earth's crust yields up its plant food slowly and grudgingly. The chemist has to a certain extent unlocked the secret of this niggardly action. By the addition of extraneous substances which act upon these sealed stores of nutriment the yielding-up process is hastened. Standing prominently among these agencies are the oxygen of the air and the water from the clouds in which carbon-dioxide and other substances are mingled. It is therefore self-evident that the early disturbance of the soil ere it becomes chilled not only admits moisture, but aids largely in the liberation of plant food whether it be accumulated in the soil by natural means or is placed there by the orchardist in the form of manure.

Manures requiring a longer time to become dissolved should at this early period be placed into the soil. Farmyard manure and various forms of bonedust are included in this section. Six pounds of bonedust sown around a matured tree—allowing the dressed surface to extend a foot or two beyond the area covered by the foliage—means approximately 6½ cwt. to the acre. In applying farmyard manure about three and a half wheelbarrow loads to each tree of normal size in full bearing would not be too much, if spread over the whole surface in the manner described.

The best results on our average soils would doubtless accrue from a judicious application, which would embody about half of each of these fertilisers. Most of our soils are deficient in humus as well as phosphates. In travelling among the orchards of this State I have not unfrequently seen water running off an orchard, carrying with it much vegetable matter into the roadside drains. There are lessons in such a sight which some day we will all be compelled to learn.

Those who contemplate extending their orchards will do well to give the planting of all deciduous trees in May a fair trial. Young trees lifted as soon as the leaves fall at the touch and replanted while the soil is still palpably warm send out young roots, and then sink into a dormant condition until the warmth of spring restarts them. Let anyone put this to test by "heeling" in a newly-lifted young tree and examining its root system carefully about five or six weeks later. Then lift and "heel" in another in midwinter and examine it after a similar lapse of time. The tree with the young roots formed, prior to going to rest, awakes in spring with the injuries of removal repaired to a very great degree, and this lead over its opponent is usually maintained.

The successful fruitgrower of the present no longer plants in a haphazard manner all the kinds of fruits that the climate will permit to grow. In years gone by any variety of fruit could be sold at a fair price, but this is all changed now. It is not the production of fruit that is the main source of anxiety now to the grower, but the securing of a market. There will always be a fair market open to the orchardist who contrives to produce certain kinds when they are scarce. This is the keynote to success in supplying the purely local markets. In supplying oversea markets the opposite seasons give a greater advantage than the slight variations of climate in producing for local wants.

In selecting kinds to plant for local markets the ripening powers of the district must be considered. It is no use planting early-maturing fruits in a late district,

as they only ripen with medium or late kinds in an early locality. A late-ripening variety in a late district is more likely to find the market payable when its fruits are ready. It is also of importance in connection with the export trade of apples to consider the ripening or maturing time of the kinds recommended for shipment. In late-ripening localities the earlier-maturing sorts, which can be picked and shipped by the end of March, such as Jonathan, London Pippin, and Dunn's Seedling, are more likely to secure the best prices in London. For South African and East Indian markets the slightly later-ripening kinds, such as Rymer, Rokewood, Sturmer, and Newtown Pippins, have proved valuable.

In choosing trees select clean, smooth-barked, healthy-looking specimens that consist of one season's growth from the graft. Anything above a medium size is not desirable. Do not take trees that have been shifted and "set back" from last season. These are usually stunted, and will remain so in future, unless the conditions and treatment are exceptionally good. The importance of preparing the soil prior to setting out the trees does not usually receive the attention it demands. Not only should the soil be broken to admit the proper penetration of the roots, but the sub-drainage should be secured. The surface soil should be fined and brought to a wholesome condition, so that the tender roots may pass readily through it in search of nourishment at the very outset. If the whole area cannot be at once brought into this condition, a fair space around each tree should be so prepared, and the remainder prepared gradually, as time and means permit.

The removal or severing of ties around inserted buds should be completed now, and the sowing of stones of peach, apricot, plum, &c., and of pips for the production of seedlings of deciduous fruits be put under way. Orange and lemon trees carrying crops of fruits infested with red scales should not be sprayed with resin wash after the early part of this month; otherwise the fruits will be stained permanently.

The success attained during this season by spraying for codlin moth with the arsenite of soda has put fresh hope into the hearts of many apple-growers. If the lessons due to the ravages of this pest during this season do not fade from the minds of the growers before next spring, much more extensive trials will be given. There will probably be a demand for efficient spraying machines at the same time. Let me ask intending purchasers to carefully consider what their needs are before selecting an implement. A pump made of materials that will withstand the action of corrosive chemicals is a first consideration. One that will occupy more of the grower's time in adjustment and repairs than is required in spraying in the orchard is undesirable. See that the machine is strongly and simply made, and calculated to not only force a good spray by small exertion, but will stand the wear and tear of hard usage, and, shall I say, not a little neglect. A few pounds extra in weight is not worth noting when the pump is to be put on wheels. An automatic agitator is also necessary.

The pruning of plum trees may be undertaken with safety during May, but, unless the area to be pruned is extensive, there is nothing to be gained by starting on them now.

SEASONINGS WITH MEAT.—The following mixtures are used in seasoning meat for pies, sausages, &c. Half an ounce for each pound of meat:—
1. White pepper, 2lbs.; cayenne pepper, 1½ozs.; salt, 4½lbs. 2. Pepper, 5lbs.; sage, 9ozs.; salt, 11lbs. 3. Pepper, 4lbs.; cayenne, 3½ozs.; sage, 8ozs.; salt, 9½lbs. 4. Pepper, 3lbs.; bay leaf, 1oz.; basil, 1½ozs.; cloves, 1½ozs.; nutmeg, 2½ozs.; cayenne, 1½ozs.; salt, 7lbs. 5. Pepper, 6lbs.; cinnamon, 6ozs.; cayenne, 4½ozs.; salt, 13lbs. 6. Pepper, 1lb.; cayenne, ½oz.; nutmeg, 3½ozs.; salt, 2½lbs.

A SELECT LIST OF FRUIT TREES, WITH HINTS ON PLANTING FOR BEGINNERS.

COMPILED BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

Land intended for planting should be thoroughly prepared some time beforehand, and if it be virgin scrub or forest land a crop of cereals or vegetables should be taken off before planting fruit trees.

Heavy clay soils are not the most suitable for fruit trees, but should such be used provision must be made for under drainage. In all cases the land should be broken up thoroughly, keeping the subsoil in its natural position. In large plantations this is best done by a strong subsoil plough following in the ordinary turning plough's furrow, thus disturbing the soil to a depth of 18in. or 20in. Soils that are saturated and boggy in winter in spite of draining should not be planted. Frosts are usually more severe and late in low-lying flats; consequently these should be avoided as far as practicable, and gentle undulations, or hillside slopes be chosen.

Peach, apricot, cherry, and all the citrus fruits do not thrive in cold saturated soils, but require well-drained situations. Plums will withstand more moisture in the soil than any other fruits. Pears and quinces may be said to come next, while apples producing fruits desired for their long-keeping qualities should not be grown in very damp situations.

In nearly every locality a windbreak is necessary, and if it be at all possible a good belt of trees—not a couple of rows—should be planted; or if natural timber be present, a strip, say of two or three chains wide, should be retained on the sides exposed to cold, cutting, or hot, withering winds. In many places the area is limited, and paling or galvanized-iron fences may be put up, close to which, on the inside, rows of almonds or loquats should be planted closely together, as they will pay for the space which they occupy and give shelter as well. Barrels or sugar baskets placed around the trees are not good protectors, as they tend to "draw" the growths up in a weakly condition.

The ultimate dimensions of the trees should be considered in connection with the soil and other conditions when planting, as in rich soils the trees will grow strongly and spread over a much wider area than in those of a poor quality. For the convenience of working, the trees should be planted either on the "square" or septuple systems; they also permit an even distribution of light and air between the trees.

About 20ft. apart can be taken as a suitable distance to plant apples, pears, plums, cherries, peaches, apricots, oranges, and lemons on the average soils of South Australia, but in richer soils greater spaces are necessary, unless the trees are judiciously pruned. At 20ft. apart about 108 trees can be set out on an acre; 24ft., seventy-five trees; and at 30ft., forty-eight trees. In small home gardens, where space is limited, trees may be set at 16ft., or even less, but they require accurate pruning in summer and winter to keep them within bounds. In commercial fruit-growing in this State there are indications that the profitable trees of the future will be of a smaller type, and consequently will be grown in closer order than heretofore.

Citrus trees may be planted in the early autumn or early spring. These are the times when they begin to make young growth. They should be lifted as soon as the buds begin to lengthen in the axils of the leaves. If there is young growth an inch or more long, nip it off. If the root system is much broken, cut back the top in proportion immediately after transplanting. Always give these trees a good soaking of water as soon as they are planted.

Deciduous trees and vines should be set out in the autumn, as soon as the leaves will rub off easily. They then make young roots to replace the

damaged ones before the soil becomes too cold. The trees should be purchased from a reliable nurseryman who has a reputation and trade to lose if he defrauds the purchaser in respect to the accuracy of names, stocks used, &c. In selecting the various trees, see that the plums are worked on myrobalan stocks, not on common plum seedlings or suckers. Pears should be on pear seedling stocks, and apples should be double worked, or worked on growths from blight-proof roots *not less than 6 in. above the surface of the ground*. The reason for this is that trees worked lower are apt, if covered by soil or mulch as high as the union, to send out adventitious roots, and thus discard the original blight-proof roots. The apricot is best upon apricot roots, and peach upon peach; but at the same time, in very dry soils, apricots may be put on almond, and peaches upon plum stocks for very wet, cold localities; but neither can be claimed as a commercial success.

Every precaution against the introduction of pests should be taken, and if the trees on arrival at the orchard could be completely submerged in a strong solution of tobacco and soap mixture for about fifteen minutes much vermin would be avoided. Citrus trees could be treated with strong resin wash to destroy scale insects. The nurseryman who fumigates his trees with hydrocyanic acid gas before sending them out will prevent the necessity for all this trouble.

In selecting trees, do not be misled by their sizes, as a medium-sized, stout, clean-barked tree is always more satisfactory than a skyscraper. A tree composed of one straight clean stem is desirable, as then the grower can cut the stem to a suitable length and form the trunk in keeping with requirements. About "knee high" is a good useful length to sever the stem to frame a sturdy weight-resisting tree. This will avoid the formation of weakly forks, as the arm junctions swell with growth. The roots of the young trees should receive attention. If the trees have been out of the soil for a few hours pretty well all the fibrous roots will perish; consequently, under such conditions they should be thinned out carefully. All broken roots should be cleanly severed above the bruise, and the cut should be made *beneath, or on the under side of the root*.

If the trees have been out of the soil long, or look shrivelled bury them completely in damp soil for a day or two. This revives them considerably.

It is sometimes necessary to put a stake to support young newly-planted trees, but this is not absolutely needful, and may be dispensed with in nicely-sheltered positions. If stakes are used, care should be taken to avoid mutilating the roots when driving them down. They should be on the side of the prevailing wind. On the whole, it may be fairly inferred that only a small proportion of the short-trunked sturdy trees of more recent plantings will require staking for the purpose of support, but a stake is at first necessary to indicate the position of the young tree when working the soil.

There are other considerations, such as suitable fencing, to keep out ground vermin, which must be properly attended to if the trees are to be a success.

The following is a list of some of the most suitable trees for planting for commercial purposes. Do not plant a large number of varieties, but confine your attention to a few of the best of each class. Take into consideration any advantages of closeness to markets or proved capabilities of the locality for producing the finest early, medium, or late fruits, and go straight for that particular object. A large collection may, during occasional years, yield the best return, but the grower who discovers what he can grow thoroughly well in his particular locality and specialises on that, will come out top during a run of seasons.

Besides being well grown, his crops must at the same time mature to meet a market which is not over supplied, or if for oversea export to be ready to pack

in time to be carried by boats leaving at the periods proved most advantageous. If the locality is new to fruit-growing the planter acts wisely to begin with a fairly large number of varieties, and he may afterwards reduce them to sorts proving most suitable for the place.

APPLES.

EARLY (for Local Markets only).—*Dessert*: Early Margaret, Red Astrachan, Mr. Gladstone, Irish Peach, William's Favorite, Lady Sudeley, Chenango Strawberry, Devonshire Quarrenden, Gravenstein, Ribston Pippin. *Kitchen*: Mobb's Royal, Lord Nelson, Lord Suffield.

LATE (for Export or Storing).—Jonathan, Cleopatra, London Pippin, Dunn's Seedling, Cox's Orange Pippin, Esopus Spitzenburg, Pomme de Nieve, Cornish Aromatic, Newtown Pippin, Baldwin, Strawberry Pippin, Dumelow's Seedling, Adam's Pearmain, Northern Spy, Buncombe, Nickajack, Sturmer Pippin, Rome Beauty, Shockley, Rymer, Scarlet Nonpareil, Stone Pippin, Winter Pearmain, Rokewood.

This may appear a formidable list, and a contradiction to the above advice *re* selecting only a few, but it must be distinctly understood that probably in no locality in this colony can more than a dozen of the sorts named herein be brought to the highest state of excellence or matured in time to catch certain markets.

PEARS.

EARLY (for Local Markets only).—Citron des Carmes, Jargonelle, Doyenne D'Ete, Williams' Bon Chretien (known here as Duchess), Wilder.

MID-SEASON (Local Market).—Poire du Berriays, Beurre Capiaumont, Beurre Diel, Durondeau, Flemish Beauty, Gansell's Bergamot, Louise Bonne de Jersey, Doyenne du Comice, Beurre Bosc.

WINTER (Keeping or Export).—Glou Morceau (known here as late Duchess), L'Inconnue, Josephine de Malines, Beurre Clairgeau, Vicar of Winkfield (known also here as Napoleon), Winter Nelis (shy bearer), Uvedale St. Germain, Swan Egg, Catillac.

APRICOTS.

EARLY.—Oullin's Early Peach (improved), Newcastle Early, Red Masculine, Shipley's Blenheim.

MEDIUM AND LATE.—Moorpark, Hemskirke, Royal, Campbellfield Seedling.

CHERRIES.

Early Purple Guigne, Early Lyons, Early Twyford, Biggareau Napoleon, Waterloo, Florence, St. Margarets.

NECTARINES.

EARLY.—Hunt's Tawny, Elruge, Irtawarra, Early Rivers.

MEDIUM.—Shortland's Tawny, Balgowan.

LATE.—Victoria, Stanwick.

PEACHES.

EARLY.—*Dessert*: Brigg's Red May, Amsden's June, Alexander's Early, High's Early Canada, Early Rivers, Early Silver, Hale's Early.

MID-SEASON.—*Dessert*: Early Crawford, Mountain Rose, Noblesse, Royal George, Foster.

AFTER MID-SEASON.—*Dessert*: Elberta, Old Mixon Free, Sea Eagle, Susquehanna. *Drying or Canning*: Comet, Salwey, Lady Palmerston, Muir, Nicol's Orange Cling, Lemon Cling, Yellow Italian.

For commercial purposes Salwey and Lady Palmerston are preferred by the canning factories, because they ripen late, when the rush of other fruits has passed. These varieties are also injured less in transit to the factories.

PLUMS.

EARLY (for local market).—Rivers Early Prolific, Early New Orleans, Angelina Burdett, Simoni (Japanese), Tragedy, Clyman.

MID-SEASON (Dessert and Preserving).—Green Gage, Kirke's, Burbank (Japanese, carries well), Prince Englebert, Washington, Yellow Gage, Reine Victoria, Ogon (Japanese).

LATE (Drying, Dessert, or Preserving).—Coe's Golden Drop, Fellemborg, Prune d'Agen (French prune), Jefferson, Pond's Seedling, Wickson (Japanese, good carrier), Reine Claude du Bavay, Belle de Septembre, Coe's Late Red.

FIGS.

DESSERT (Pale Skins).—White Genon, Brunswick, White Adriatic.

" (Dark Skins).—Black Ischia, Castle Kennedy, Black Turkey.

ALMONDS.

SOFT SHELL.—Brandis (tall grower), Nonpareil, Californian Paper Shell (low spreading trees), Ne Plus Ultra (medium habit).

ORANGES (SWEET).

Acme (smooth round fruits), Blood or Maltese, Homasassa Sweet, Jaffa, Oval China, Mediterranean Sweet, Paramatta, Rio, St. Michael, Siletta, Valencia late, Washington Navel.

MANDARINS.

Dancy's Tangierine, Emperor, Beauty of Glen Retreat, Scarlet, Parker's Special.

CITRUS (FOR PRESERVING).

Poorman, Flat Seville, Bengal Citron.

LEMONS.

Lisbon, Eureka, Villa Franca. (The last two named sorts are nearly thornless.)

TABLE GRAPES.

BLACK.—Black Hamburg, Black Prince, Grand Turk, Madresfield Court Black Muscat, Mrs. Pince's Black Muscat, Wortley Hall, Muscat Hamburg, Trentham Black.

RED.—Red Prince, Malaga, Frontignac, Lady's Finger.

WHITE OR PALE AMBER.—Crystal, Belas Blanco, Morillon or Doradillo, Green's Early, Muscatel (Gordo Blanco), Raisin des Dames, Daira, Sweet water, Waltham Cross, Temperano, Santa Paula, Pedro Ximines, Grand Cennial.

FOR EXPORT.—Doradillo, Daira, Belas Blanco, Muscatel.

MILDURA NOTES.

A careful inspection of our vineyards has just been completed by one of the officers from the Rutherglen Viticultural Experimental Station. The result has been to demonstrate the present freedom of the settlement from phylloxera. At the same time the greatest interest has been awakened in the subject, and the Horticultural Society, at its annual meeting in April, resolved to press for power to secure the exclusion or fumigation of all nursery stock sent to Mildura, and also to take steps to get an experimental nursery for resistant vines established here.

The Rutherglen Station is distributing grafted American vine roots at a charge of £2 per 1,000, and M. Dubois and his confrères are urging their speedy adoption throughout the State. It seemed probable that a large number

would be imported here, as many orders were in contemplation from different growers. Recognising the possible danger of introducing the disease along with the resistant roots, and realising at the same time the impossibility of preventing the importation of the American vines in the face of the decision of the Government and the recommendations of the State experts in their favor, the Horticultural Society has resolved to pursue the middle course of promoting the establishment of a nursery for the raising of our own resistant stocks—importations to be restricted to cuttings—by which means the danger of introducing the pest along with the remedy may be reduced to a minimum.

The present is rather a moment of depression in Mildura, though there are excellent prospects ahead. The 1901 raisin crop was an exceptionally large one, but sales were effected with difficulty, and there is still a big carry-over of stock. The trouble appears to have arisen through the protracted delay over the tariff, and through what looked like an attempt on the part of the Melbourne merchants to break down the Trust schedule of prices. In this they were not successful, though certain concessions were made for purchases in bulk. This season's yield has been a light one, and the drying was pretty well finished by the middle of March—much earlier than usual, owing to the general failure of the second crop. The apricot harvest was also a poor one, and the great bulk of last season's fruit still remains unsold. Apricot and peach prices will probably need to be lowered, but the raisin prices, ranging from 4d. upwards, cannot be considered excessive.

Some excellent returns have been secured by currant and sultana growers. The currant crop was not generally equal to last year's, but several growers obtained over a ton of dried fruit to the acre, and one man secured an average of 49cwt., or 6 tons 16cwt. from two and three quarter acres. This is looked upon as the biggest return yet obtained in Mildura from the Zante. Girdling was tried by a few growers with conspicuous success, but not on a large scale. On ground accustomed to produce good crops the size of the fruit was found to be increased; and on salty ground, where the vines have been accustomed to cast their bunches undeveloped, a very marked improvement in the quantity borne was discernible.

The results of a careful inquiry into the conditions of the currant industry in Mildura, recently published in the *Cultivator*, establishes the Zante as one of our best paying products. On the best ground and in saline soils the sultana does better, but on inferior land, if free from salt, the currant yields appear to surpass those of the sultana.

Except on the poorest land, yields from sultana vines run about a ton per acre, dried, and occasionally rise to 2 tons. With the fruit selling at 7d. and 8d. per pound, this means a big return; and it is no uncommon thing for three-year-old vines to reach the ton per acre. Four hundred acres were planted to sultanas last year, and there are hundreds of thousands of vines rooted for planting out this season.

The lemon crop will be unusually light, owing probably to the effects of last winter's drought, but prices promise to be good. Last season's slump in this fruit was the most disastrous yet experienced by Mildura growers, prices refusing to rise even by December. "Cured" lemons, which usually command high prices in November and December, were sold in some instances at an actual loss.

Things in general are decidedly on the up-grade; but the winter promises to be a hard one for the casual laborer. Little is being done on the railway line, owing to the want of water along the route; and the promised loan of £10,000 for Irrigation Trust purposes is not at present forthcoming, owing to a depleted treasury. This means that concreting and other channel work will be at a standstill, during the early part of the winter at least, and possibly throughout the winter months.

RENMARK NOTES.

The Trust loan works are now again in full swing. Great benefits have been obtained from last winter's work. The concreting of the 60ft. and 40ft. channels have been a great boon to the settlers; several orchards which were threatened with destruction from seepage have happily been averted. New engines will be put at No. 1 and No. 3 pumps to take the place of the old ones, which were not powerful enough for their work.

The new wharf is progressing rapidly, and when finished will greatly facilitate the loading and unloading of the river boats.

Settlers here are grubbing out their lemons owing to poor prices obtained in past years, and are planting in their place vines—sultana, currant, and Gordo Blanco. Apricot trees where planted on unsuitable soils are also being grubbed out and replaced with vines, which grow remarkably well here.

Rain is wanted badly, and the pumps have had to start work again for a general irrigation.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Company report :—

May 1, 1902.

After the welcome rains that fell during the closing days in March the weather in this State continued very dry; in fact, unusually hot summery conditions prevailed, so that the benefit of the previous rains has been nearly all lost, the young grass which had appeared quickly burning off. A few days ago moist conditions commenced to show, but very little rain has as yet fallen. The cold season having now set in, good winter feed can only exist in a few favored places, so that, generally speaking, cattle will have a bad time during the coming winter, and the long drought that has continued over a great part of this continent for seven or eight years, it is to be regretted, cannot yet be reported as having broken up.

Trade in the city is of ordinary character, but country business, especially in the North, shows the influence of the bad times, which is affecting particularly our cattle and sheep raisers there. The dullness in the metal markets prevents the considerable expansion that might otherwise take place in the mining industry here; but the late very satisfactory developments at Tarcoola lead many to think that this goldfield at last is about to come to the front in production.

In breadstuffs shipments of wheat for export have almost finished, owing to the very limited quantity available for oversea ports, so that it is scarcely likely another full cargo will be dispatched this season. The market locally, although quiet, is very firm, parcels now being held for 4s. per bushel, whilst smaller quantities are quoted at 1d. less. Flour has taken a sharp advance during the month, partly in sympathy with the rise in wheat, but more especially under the influence of several of the mills being shut down. This also has affected the offal market, both bran and pollard having hardened quite 3d. per bushel, and with feed scarce is selling readily at the higher rate. It is a straightout weather market in fodder lines, buyers operating freely, whilst farmers are loth to part with their hay even at the advanced rates in face of this dry weather. During the month Sydney has been operating heavily in chaff, although orders have steadied at the moment owing to Victoria competing. Oats are also finding good business at advanced rates.

Potatoes have been coming forward freely, the Mount Gambier district supplying most, although fair deliveries from the hills and South were being made, but are from this source now tapering off, and a steady increase in importations showing. The season here for Tasmanian potatoes has hardly yet commenced, but next month may be expected to get into swing. The absence of rain is making it more certain that the crops in this State remaining to be dug will turn out lighter than hitherto estimated, so the tendency is towards firmness, a rise of 10s. having been established here, although inter-State markets have been very lifeless during the month, but are now brisk. Local onions in sufficient quantity for trade wants are being delivered, and sluggishly following the sharp upward movement in price that has been taking place during the last ten days in Victoria. Moderate stocks are held in Mount Gambier, where the price is relatively higher than in the city.

In no direction is the disastrous effect of the drought more evident than in dairy produce lines, increasing quantities having to be imported week by week to fill requirements. Locally-made butter especially is in short supply, so that values here, in sympathy with the markets of the eastern States, have steadily moved upward, and the outlook appears towards still higher rates. Early in April a recovery in price of eggs showed, and continued through the

month, with every probability of extreme rates ruling during the winter, assisted by the federal duty of 6d. per dozen. The warm weather lasting later than usual kept demand for cheese going, so that good prices have been realising, and heavy importations must be made till the new season's make is on the market—at earliest four or five months hence. Active business has also been doing in bacon, and though during several weeks the raw material here ruled lower, inter-State orders coming on this market prevented prices from receding. Moderate business put through in honey, but demand has again slackened off. Beeswax scarce. Almonds finding ready sale.

The unseasonably sultry weather during April stopped country people from slaughtering for pork and veal for market, so that deliveries are likely to be larger from this out now that the cool weather has set in, and the market for both lines continues satisfactory. In live poultry good figures ruled for all but turkeys until about ten days ago, when, owing to slackened export demand, values ceased. This, however, does not apply to well-conditioned fowls, which are very scarce, a large and undue proportion of the birds coming forward being only fit to pen up for fattening.

MARKET QUOTATIONS OF THE DAY.

Wheat.—Port Adelaide—Shipping parcels, f.a.q., 3s. 11d. to 4s., f.o.b.; farmers' lots, 3s. 9d. to 3s. 10d. on trucks, per bushel of 60lbs.

Flour.—City brands, £9 7s. 6d.; country, £9 to £9 2s. 6d. per ton of 2,000lbs.

Bran.—1s. 3d.; pollard, 1s. 3½d. per bushel of 20lbs.

Oats.—Local Algerian and dun, 2s. 9d. to 3s.; prime stout feeding, white, 3s. 3d. to 3s. 6d. per bushel of 40lbs.

Barley.—Malting, 4s. to 4s. 4d.; Cape, 2s. 10d. to 3s. per bushel of 50lbs.

Chaff.—£3 15s. to £4 per ton of 2,240lbs., bags in, dumped, f.o.b., Port Adelaide.

Potatoes.—New locals, £5 10s.; Tasmanian, £5 2s. 6d.; Mount Gambiers, £4 12s. 6d. per 2,240lbs.

Onions.—Local Spanish, £7 to £8; Mount Gambiers, £8 10s. per 2,240lbs.

Butter.—Creamery and factory prints, 1s. 5½d. to 1s. 8½d.; private separator, 1s. 2½d. to 1s. 6d.; best dairy and well-graded store, 1s. 1d. to 1s. 3d.

Cheese.—South Australian factory, 7½d. to 8½d.; New Zealand, 9d. per pound.

Bacon.—Factory-cured sides, 7½d. to 8d.; farm lots, 6½d. to 7d. per pound.

Hams.—South Australian factory, 8d. to 9d. per pound.

Eggs.—Loose, 1s. 3d.; in caaks, f.o.b., 1s. 4½d. per dozen.

Lard.—In bladders, 8d.; tins, 7½d. per pound.

Honey.—3d. for best extracted in 60lb. tins; beeswax, 1s. 2d. per pound.

Almonds.—Softshells, 5½d.; kernels, 11d. per pound.

Carcass Meat.—Bright shop pork is worth 4½d. to 5½d.; ordinary and dull stuff, 4d. to 4½d.; good baconers, 4½d. to 4½d.; heavy weights and choppers, 3½d. to 4d.; there is an absence of well-fed veal, which is worth 3d. to 4d.; poor-conditioned, slow, at 1d. to 2d.

Live poultry.—Heavy table roosters, 1s. 7d. to 1s. 10d. each; good hens and fair cockerels, 1s. 1d. to 1s. 4d.; poor and weedy sorts hard to quit at 7d. to 11d.; ducks, 1s. 2d. to 1s. 8d.; geese, 2s. 6d. to 3s. 3d.; pigeons, 7d.; turkeys, 4d. to 6d. per pound live weight for fattening sorts to table-conditioned birds.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, flour, and forage for export are f.o.b. prices at Port Adelaide. Dairy products are city auction mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese.

MISCELLANEOUS NOTES.

TO RAISE SUGAR GUM TREES FROM SEED.—Mr. H. J. Spencer, of Nantawarra, reports that sugar gum can be very easily raised from seed in the following manner:—Get a number of old jamtins and place in fire to melt the solder, then discard the tops and bottoms and place the tins in a box as close as they will pack. The box should be about an inch higher than the tins. Fill up tins and the spaces between with good mould, and water well to settle. Then drop one or two seeds into each tin, cover very lightly with finely sifted soil, and cover with one thickness of branbag to prevent the surface from drying and cracking. Water carefully, and leave the bag on until the plants appear, which should be in from seven to ten days, when the bag should be removed. February was the best time to sow seed, but they will grow all right if sown in January or March. Forest Department sows in March or December (*Journal*, July, 1901, page 1009).

LABELS FOR GARDENERS.—Paint label with whitelead paint, then at once write on it with lead pencil. This will cut down to the bare surface, and last for years.

SORE SHOULDERS, CUTS, &c., OINTMENTS FOR.—Mix 2drms. sulphate of zinc and 2drms. of sugar of lead in half a pint of rainwater. (2) Rub with carbolic oil. (3) Beeswax, 4ozs.; lard, 8ozs.; resin, 4ozs.; honey, 2ozs.; mix and boil slowly; while boiling add 1pt. spirits of turpentine; stir until cool.

RED WATER OR BLOODY URINE.—A change of food is necessary. The following drench should be given:—Epsom salts, 16ozs. to 24ozs.; sulphur, 2ozs. to 4ozs.; gentian and ginger, of each 1oz.; calomel, 1drm. This given with treacle and warm ale or gruel.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of April, 1902:—

Adelaide	0·37	Manoora	0·18	Macclesfield	0·49
Hawker	0·07	Hoyleton	0·31	Meadows	0·33
Craddock	0·24	Balaklava	0·38	Strathalbyn	0·23
Wilson	0·08	Port Wakefield	0·22	Callington	0·26
Gordon	0·17	Saddleworth	0·28	Langhorne's Bridge..	0·24
Quorn	0·11	Marrabel	0·10	Milang	0·37
Port Augusta	—	Riverton	0·25	Wallaroo	0·30
Port Germein	0·41	Tarlee	0·30	Kadina	0·39
Port Pirie	0·58	Stockport	0·02	Moonta	0·38
Crystal Brook	0·10	Hamley Bridge	—	Green's Plains	0·10
Port Broughton	0·16	Kapunda	0·29	Maitland	0·62
Bute	0·08	Freeling	0·16	Ardrossan	0·12
Hammond	0·10	Stockwell	0·19	Port Victoria	0·21
Bruce	0·06	Nuriotpa	0·21	Curramulka	0·06
Wilmington	0·23	Angaston	0·17	Minlaton	0·06
Melrose	0·38	Tanunda	0·30	Stansbury	0·10
Booleroo Centre	0·17	Lyndoch	0·23	Warooka	0·08
Wirrabara	0·30	Mallala	0·23	Yorketown	0·29
Appila	0·20	Roseworthy	0·16	Edithburgh	0·21
Laura	0·37	Gawler	0·15	Fowler's Bay	0·14
Caltowie	0·26	Smithfield	0·19	Streaky Bay	0·05
Jamestown	0·33	Two Wells	0·24	Port Elliston	0·14
Gladstone	0·19	Virginia	0·29	Port Lincoln	0·37
Georgetown	0·14	Salisbury	0·16	Cowell	0·30
Narriidy	0·12	Teatree Gully	0·38	Queenscliffe	0·03
Redhill	0·10	Magill	0·30	Port Elliot	0·46
Koolunga	0·11	Mitcham	0·13	Goolwa	0·40
Carrieton	0·07	Crafers	0·32	Meningie	0·50
Eurelia	0·09	Clarendon	0·54	Kingston	0·27
Johnburgh	0·07	Morphett Vale	0·14	Robe	0·29
Orroroo	0·24	Noarlunga	0·05	Beachport	0·27
Black Rock	0·37	Willunga	0·14	Coonalpyn	0·15
Petersburg	0·10	Aldinga	0·21	Bordertown	0·05
Yongala	0·03	Normanville	0·11	Wolsley	—
Terowie	0·16	Yankalilla	0·18	Frances	0·11
Yarowie	0·58	Eudunda	0·34	Naracoorte	0·16
Hallett	0·23	Truro	0·16	Lucindale	0·15
Mount Bryan	0·07	Mount Pleasant	0·17	Penola	0·42
Burra	0·25	Blumberg	0·18	Millicent	0·23
Snowtown	0·07	Gumeracha	0·14	Mount Gambier	0·28
Brinkworth	0·09	Lobethal	0·20	Wellington	0·49
Blyth	0·34	Woodside	0·17	Murray Bridge	0·25
Clare	0·51	Hahndorf	0·20	Mannum	0·09
Mintaro Central	0·27	Nairne	0·54	Morgan	0·46
Watervale	0·48	Mount Barker	0·32	Overland Corner	0·07
Auburn	0·52	Echunga	0·31	Renmark	0·18

CONFERENCE OF SOUTH-EASTERN BRANCHES.

The tenth Annual Conference of South-Eastern Branches of the Agricultural Bureau was holden at Millicent on March 19.

Representatives and Visitors.

The following representatives of Branches were present:—Millicent.—Messrs. H. F. Holzgrefe (chairman), E. J. Harris (Hon. Sec.), R. Campbell, S. J. Stuckey, J. Davidson, H. A. Stewart, W. B. Crouch, B. Varcoe, G. Mutton, H. Warland, H. Oberlander, and A. MacRostie. Mount Gambier.—Messrs. W. Mitchell (chairman), J. Watson, Thos. Edwards, Geo. Bodey, and A. J. Wedd. Naracoorte.—Messrs. S. Schinckel (chairman), A. Johnstone, and J. Wynes Lucindale.—Mr. H. Langberg. Visitors.—Gen. Secretary (A. Molineux), and Mr. G. Jeffrey (Wool Instructor, School of Mines), and a large number of residents of the district.

Exhibits of Products, &c.

The institute hall was crowded with exhibits of products of the garden, orchard, vineyard, and farm, as well as of the industrious work of the ladies at home. Nearly every exhibit was of a high order of merit, and there was nothing that was not of considerable interest. The bulk naturally was staged by residents of Millicent, but a lot came from Mount Gambier, Penola, and elsewhere.

Chairman's Address.

Mr. H. F. HOLZGREFE took the chair, and hoped that the conference would be instructive and beneficial to all. It was interesting to look back forty years, and compare the condition of things then in matters agricultural with what they were now. But we would see that a great deal remained to be done—diseases in stock to be combated and remedies found, and diseases in cereals and other crops, and such pests as the codlin moth, to be grappled with; and one of the principal objects of the Bureau should be to endeavor to find remedies for these. Some people asked—What had the Bureau done so far? He said they had done a good deal in the line of progress. (Mr Molineux—"Hear, hear.") They had many difficulties to contend with, one of which was the finding of markets for their produce if they were to keep time with other parts of the world, which were improving as fast as we were. It was often said that Europe—England, Germany, and France—and America were in the van of progress, but there were other countries, even Russia, that were making wonderful progress in agriculture. It was well to know this, as these peoples were competing with us in the world's markets. The present agricultural want was brains and sinews to work together intelligently and keep abreast of the latest improvements. He hoped he was a better farmer than speaker, but he trusted the proceedings of that day would be interesting and profitable.

An Agricultural Lecturer Required.

Mr. A. JOHNSTONE, Naracoorte, read a paper on "How best to utilise the services of the Professor of Agriculture for the benefit of the Farmers." The paper, he said, had been given before the Naracoorte Branch and printed in full, but he hoped it would nevertheless prove interesting to members. He was pleased to remark, in this connection, that some of the views advocated in the paper had been adopted by the Government. The writer commenced by stating that at present the people did not reap the full advantage of the services of the Professor of Agriculture, who has to devote himself exclusively to

experiments at the college, and the information given was generally vague and theoretical. He urged that the Professor should visit the more important districts regularly, and give advice as to the best treatment of the soils, &c. The Government, he pointed out, had already done more than he had previously advocated, by supplying both manures and seed for experimental plots in various parts of the State. These experiments would prove a valuable object lesson. He also advocated the system of analysis of the soil, to arrive at a better estimate as to the requirements in different localities.

Mr. WEDD thought it would be a very good thing if they could have the expert among them sometimes, to see the land and analyse some of the soils, and give the farmers advice on the use of manures.

Mr. MOLINEUX did not think the professor, with a college of forty or fifty students to conduct, the internal management to superintend, and an experimental farm to manage, could undertake many visits to the country districts. What they wanted was a peripatetic professor, who could go round and lecture and advise farmers generally. If the professor had been able to have written a series of monthly seasonable agricultural articles in the *Journal of Agriculture* he might have done more valuable work than going about and addressing a certain limited number of farmers. Land differed so much in every district that analyses of soils would be of little value unless thousands of them were made, and even then there were other conditions that would modify their value. He approved of the cultivation of experimental plots. The chairman had spoken of the codlin moth, but the best remedy (so far as known) for it was spraying again and again, and after that bandaging, and then picking off the infested fruit and promptly immersing it in water. By spraying four times 95 per cent. of the fruit might be saved, and after the first cost of the sprayer it would not cost more than a shilling a tree to do it.

Mr. JEFFREY considered it would be impossible for the Professor of Agriculture to do the work suggested in the paper, but he believed the time was not far distant when the Government would adopt the system now followed in Victoria, where they had appointed a permanent head of the Agricultural Department.

Mr. R. CAMPBELL said Professor Towar, who was appointed successor to Professor Lowrie, had been engaged in the lecturing duties advocated by the writer, and would be a power for good in that direction when he arrived. Other speakers concurred with the writer of the paper, and a resolution adopted recommending the appointment of a travelling lecturer on agriculture.

Raising Fat Lambs for Export.

Mr. GEORGE JEFFREY, Wool Instructor to the School of Mines, spoke to the following effect:—

He would consider the subject from the following points—(1) Is fat lamb-raising profitable? (2) Is this a suitable district for the industry? (3) What kind of ewes should be kept for fat lambs? (4) What kind of rams should be used? (5) How the sheep should be treated. He thought it was self-evident that raising fat lambs for market was a very profitable industry, and reminded them that if it had not been for the fat lamb trade New Zealand would not be in the splendid position she occupies to-day. To the second question he unhesitatingly answered "Yes." The Millicent district, in his opinion, was eminently suited to the industry, and he fully believed it would be even more so if the growers turned their attention more to the raising of fodder crops, such as mangolds, turnips, kail, rape, and kohl rabi, in order to properly feed the lambs; and this would also justify them in breeding more for market. As to the third question, dealing with the kind of ewes most suited for the lamb trade, he was aware that the conditions here were somewhat different to those obtaining in many other parts of South Australia. Therefore he did not intend to advocate the Merino ewe, because experience has shown that that animal does not do so well here on account of its liability to footrot, fluke, and other diseases. This forced them to turn to the crossbred as better and more profitable than the Merino; and he was quite

satisfied the breeders here had not very much to complain of in this regard: rather the growers had reason to be proud of the quality of ewes used. But, in his opinion, the same could not be said of the rams employed, for he was bound to say that the rams, on the whole, are a disgrace to the district; and he would say also that the lambs are not what they should be. Why, in the South-East everything was favorable for raising the finest lambs in Australia, but instead of that, whilst they produced some lambs that occupied a good position in the market, there were many that did not hold anything like the position they should. This was all due to the custom of using the wrong class of rams. He was not going to say the wrong type of ram, because there have been good results from different types: but what he really meant was the rams were, generally speaking, not the real pure bred, but, plainly speaking, mongrels. This remark could be applied to most of the so-called Shropshire, Lincoln, and Merino rams. The type of ram he would recommend was one of the early-maturing breeds—not necessarily a Shropshire, because it was well known that the Suffolk and Dorset Horn also gave excellent results; but, seeing that these breeds were hard to get, he had little hesitation in saying that the pure Shropshire or Southdown (Shropshire for choice) was the best ram for the purpose mentioned. As to the treatment of the sheep, he cautioned them against over-stocking, as it was proved that this policy did not pay. Sheep must be generously fed to produce the best results. Upon the question of breeding ewes he was firmly convinced that when a farmer had embarked on the fat lamb industry it always paid him better to buy instead of breeding his ewes. So far as he knew there was no difficulty here in procuring ewes, so that the course recommended did not present any objections.

The CHAIRMAN said it was a rather strong statement that the rams used in the district were a disgrace to it; nor did he altogether agree that farmers should purchase their ewes from the large sheep-owners. He could breed ewes as well as they could, though he admitted that later on they might do a better business by buying ewes and raising fat lambs. He was quite in accord with Mr. Jeffrey about over-stocking.

Mr. WEDD stated that the large breeders about Mount Gambier had spent thousands of pounds on rams for the improvement of their flocks. The long railway journey, and the knocking about in consequence of the break of gauge, deteriorated the fat lambs sent to the freezing works. There was a large number of Shropshire and Southdown rams in the district.

Mr. E. CROUCH had got good lambs from Southdown rams and three-quarter-bred Lincoln ewes. Lambs were often left too long with their mothers, and this was probably the cause of their bad reputation. In New Zealand many farmers bred only from purchased ewes, and sold the ewes after the lambs had been taken away. Whatever the breed, if they gave them plenty of food they would be good; but which was the most profitable breed was another question. He had 90 per cent. of lambs from Merino ewes and Lincoln rams.

Mr. W. B. CROUCH had his lambs dropped in September, when they had the advantage of green feed; after that they had maize, rape, and other fodder crops that he grew for them. They were ready to send off early in the season, and their weights were up to 38lbs.

Mr. JEFFREY, in reply, thought he had been a little misunderstood. It was only the rams he took exception to. He was well aware many pure-bred rams had been imported into the district, but was at the same time aware that many rams that were brought to the South-East were purchased from men who were not on the record as Shropshire sheep breeders; and many so-called Shropshire rams were not pure-bred. That being so, the production of satisfactory lambs was impossible. He agreed with the Chairman that the farmers could breed their own ewes but the point was—Could they do so as profitably as they could buy them? Mr. Crouch referred to the Hampshire breed, which he knew was a good one, but it had a big head, was an exceedingly gross feeder, and also a light clipper. For the lambs the clip was not very material; they would be sold. If they wanted wool and mutton also they must not breed from the Shropshire, or Dorset Horn, or Down breed, or Hampshire rams. He thought Mr. W. B. Crouch had struck a good point in getting his lambs at a good time.

He did not say, however, what type of sheep they were. (Mr. Crouch—"Shropshires and crossbreds.") He would not allow that the long railway journey was the only cause of South-Eastern lambs bringing lower prices than they should. Agents who saw the lambs on the farm at their best were of his opinion. He rather thought the present tendency in Australia to breed the Shropshires for wool was going a little too far. For early maturing lambs it had been found that young rams were the best.

Luncheon.

An adjournment was then made to another room, where about 100 members and visitors partook of a very nice and varied repast, provided by ladies of Millicent and environs.

Dehorning of Cattle.

After lunch two papers upon this subject were read, both ably reviewing the subject from all points, and succinctly describing the advantages of the practice. The first read was by Mr. E. F. Crouch, who also exhibited the shears used in the operation and several excellent photographs showing the bails and the method of dehorning. The other paper was written by Mr. George Kiddoch, who was unable to be present. The following is the substance of the two papers:—

Horns on domesticated cattle are useless, dangerous, and a disadvantage. This has long been recognised. Mr. McCombie, of Tillyfour, Scotland, collected all the black polled cattle he could find and started the polled Angus herd. Since then a polled Durham breed has been encouraged in America, the breeders of which speak constantly in praise of them. Caustic potash ("lunar caustic") applied to the budding horns on calves has been successfully used for suppression, but if not carefully used may fail, and result in the development of snaily horns. The process is also too slow where there are many calves to be treated during the year. The Newton patent deborner or the "Keystone" or some similar instrument takes off the horns neatly and instantaneously, without any injury. Thousands of cattle have been dehorned by Mr. Crouch without a single loss, and all the cattle on Mr. Kiddoch's Koorine estate have been similarly treated without loss, although several of them were old cows. The yards in which the work is done have a race 2ft. 4in. wide, with sliding gates to keep cattle ready, and at the end of the race is a bail, strongly made, to hold the head of an animal so that it cannot move while undergoing the operation. The operator has a rope fastened to the bail stick, and when the head is through the rope is pulled. Attached to the bail stick is a pall, which falls into position, securing the animal. Then a bar 4in. x 3in. and 12ft. long is pulled down on the upper part of the neck and secured. The animal now being ready, the machine is placed on the horns, the assistant presses the point down, and the handles are closed, cutting off the horn with about a quarter of an inch of skin attached, with a quick clean cut, taking but a second or two, unless the animal is an old cow, in which case they are hard to do, in many cases the pith being nearly solid. The other horn is done in the same manner, and an application in thick Stockholm tar is applied, and in about six weeks' time the wound has grown over. The object of cutting off a piece of skin is, firstly, it is more easily cut; secondly, the skin grows over the cut; and thirdly, the animal has the appearance of a natural poley. The operation cannot be very painful, since quiet cattle start to feed within a few minutes after its performance. Large herds of cows have been dehorned, and the diminution in their milk flow has been decreased only slightly for a few days, after which the normal quantity has been yielded. The best time to operate is in autumn, when all danger of flies is over; or September is a good time, except for the cold winds. Young cattle must be nine months or more in age, by which time the horn is sufficiently developed to have a hollow in the core. If younger the solid piece of core left will continue to grow and make a snaily horn. It does not matter how much older the animal may be; but old cows may have nearly solid core, and that is difficult to cut through. The advantages of owning hornless cattle are numerous. They are quiet and, having no weapons of offence, seem to feel no desire to gore either human beings or other animals. Many people are injured or killed by horned cattle, to say nothing about the very great number of cattle and other animals that are gored and hurt by them. Cows especially damage each other in the yards during milking time, and at the watering troughs, and when all this pain and injury to life and property can be prevented by the infliction of a very temporary inconvenience to the horned beast it seems to be the bounden duty of the owner of the animals to deprive them of their weapons of offence. Even dangerous bulls have been subdued and rendered quiet and

inoffensive when deprived of their horns. Where cattle are fed at racks or watered at troughs one or two aggressive horned beasts can tyrannise over all the rest, some of which will have to go short of feed or water; and in the case of cows the worry will diminish their flow of milk. When cattle have to be trucked they can be railed long distances without sustaining any injury if they are devoid of horns—they can neither be gored nor can their horns become entangled in the sides of the truck. Cattle undoubtedly do better after being dehorned, and the temporary suffering from dehorning is amply compensated by freedom from goring and worry where all the animals carry their weapons intact. The only drawback seems to be that dehorned animals do not look to be as large as those with horns, but butchers will soon learn to make the proper allowance.

Questions were asked *re* the caustic potash treatment. Mr. H. A. STEWART said he had used it successfully on very young calves, but it seemed to have given a good deal of pain; and if not thoroughly and properly applied snaily horns would be developed..

The Advantages of Dairying.

Mr. J. DAVIDSON, manager of the Murrumbum Cheese Factory, read a paper to the following effect:—

There were many farmers engaged in dairying in a lukewarm kind of way who failed to make it pay because they were without devotion to and enthusiasm for their business. If one were inoculated with that feeling it would be better to give up dairying and adopt some other pursuit. But before deciding to abandon dairying it would be well to consider the possibilities that were found in it, and the advantages which it offered. In the first place, it was the only branch of farming which, if properly pursued, would leave the farm very much richer and more fertile than it found it. Proper dairy farming took practically nothing from the farm, and if the money realised from the sale of the by-products were invested in the purchase of artificial manures to help to grow fodder crops the land would be steadily growing richer and more fertile. Then systematic dairying afforded steady and profitable work the whole year round, and the product was readily saleable. Again, dairying furnished a highly condensed product as compared with wheat, potatoes, &c., and the carriage of it to market did not take the gilt off the price obtained. For instance, butter is worth £100 per ton and cheese £50, and it would cost no more to carry a ton of these products to market than would be charged for a ton of grain. The dairy, moreover, gave a finished product, and the almost universal rule was that an article that was ready for immediate consumption commanded relatively better prices than those which had to be handled by half a dozen men, with perhaps as many profits, before they reached the consumer. Dairy work, too, brought a steady constant income from month to month, which enabled the farmer to pay as he went all the year round. Furthermore, the work had to those engaged in it a future, for there was always something to learn. It was one of the branches of farming in which the spirit of investigation and the inventive faculty of the country were most actively engaged, and it was gratifying to note that Australian farmers were giving more time and attention to reading and study, which was a hopeful sign. Another advantage of the dairying industry was that there were no present indications of over-production of the best butter and cheese. There was also a possibility of profitably utilising all the by-products of the dairy in raising pigs and calves. Pig-keeping and bacon-curing should always be a necessary adjunct of dairy farming, and were paying lines. Progression in dairy farming was very evident throughout Australia to-day, which was very gratifying, for dairying, he said emphatically, was a sound business, built upon a solid foundation, and possessing a brilliant future. There were other advantages connected with dairying that he would not refer to in detail, but their general result was that of all communities of farmers in Australia and New Zealand none found themselves in easier circumstances, and with more cash in the bank, than those in which dairying was intelligently and diligently pursued.

In the discussion it was mentioned that milk sugar (used in medical practice), biscuits for human consumption and for dogs are largely manufactured from separated milk and from whey.

Mr. E. B. CROUCH, to illustrate the great profits of dairying, stated that a friend of his recently bought 130 acres at £45 per acre, and his gross returns for the first year totalled £1,200.

Sound Pastures and Pure Water for Stock.

This was a paper by Mr. T. H. Williams, Stock Inspector, read by the Hon. Secretary, to the following effect:—

There was not a subject which should more seriously engage attention than that of providing

souder pastures and pure water for stock, particularly dairy cows. There was no part of Australia where this could more easily be done but was more neglected than in the South-East, the result being a heavy mortality among cows, which suddenly die in from a few hours to two or three days. Some believed death to be caused by some new disease, but on many runs it was due to deficiency of pastures and impure water. Some have lost every cow they possessed, and those who have studied this subject contend that land depleted by continued cropping will not maintain animals in bulk and vigor. Animals continually grazing on the land will exhaust it, just as cropping, only more slowly. In this case cattle now die of impaction owing to deficiency of phosphates in the soil. Therefore the only thing for the stock-owner to do was to manure the pasture land with phosphates. He knew of cattle now doing well on pasture land so treated where they could not previously be kept with profit because the land was deficient in phosphate of lime, sulphate of iron, &c. What applies to cattle in this matter also applies to sheep. But having sound pastures for stock was only one step in the right direction. The stock also wanted pure water. Stock, as well as human beings, need pure water, and they do not get this at some of the filthy dug-out waterholes which have never been properly cleaned. More deaths were caused by this impurity than by any other cause. Stock refuse to drink the water contaminated by excreta, and the result is inflammation and impaction, loss of milk, and death. Particulars of cases might be mentioned where watering stock from holes has been abandoned, with surprising results. Watering places should not be provided within 200yds. or 300yds. of cesspits in localities where the flood waters rise rapidly to the surface.

The GEN. SECRETARY said that 20s. worth of bonedust per acre would be more beneficial to permanent pastures than would be an equal value of superphosphate. In some localities kainit would be of value, especially where there is a good rainfall. He had recently heard Inspector Dowdy utter the opinion, which was supported by authorities, that impaction is an after effect of acute inflammation in the fourth stomach of cattle, caused by dry, fibrous, innutritious fodder. If the animal dies quickly after being attacked, the omasum would not be impacted; but if the trouble lasted for some time then the "bible" would be found impacted. The best way to apply bonedust was broadcast on grass lands.

Mr. MITCHELL said he had applied superphosphates to pastures at Kallangadoo, and the cattle preferred the herbage there. He had tried bonedust without any good results up to the present.

The CHAIRMAN had noticed improvement in his stock since he erected windmills and troughs some years ago. He used a little iron sulphate in the water—about 1lb. in a 200-gallon trough—and had applied about 5cwt. bonedust per acre during the time.

Members now adjourned for tea.

EVENING SESSION.

At 8 o'clock a large attendance of members and friends filled the hall, and the Chairman called upon the Hon. Secretary to read Dr. Ockley's (Penola Branch) paper, to the following effect:—

IMPROVEMENT OF GRASS LANDS.

At the latest conference of South-Eastern Branches of the Agricultural Bureau, the President of the Central Bureau inquired if anyone had employed chemical manures to improve his pasturage, and he adduced several instances of the benefits to be derived from their use. Now most of the deductions were taken from European sources, and as the conditions of climate and markets there are so widely different from those here, it is necessary to somewhat modify the conclusions arrived at. There is always that great desideratum, viz., to secure the greatest return with the smallest amount of exertion. Australian labor often defeats its own ends by taking advantage of the employer to hamper or even leave him in the lurch at critical periods and thus causing a lessening demand, as an otherwise speculative employer will hesitate because of the great uncertainty of being able to rely on his employes to meet him at mayhap a critical stage. This it is that is causing many agriculturists to cast a longing eye on pastoral work.

The sheet anchor of the pastoralist is good and abundant succulent pasture, nature being always ready to respond to generous treatment. We are now at a period when we must give

our pastures the same care and attention we have been giving our green fields; first and foremost, to clear up all dead and fallen timber. Rotten timber produces coarse and rank growths, whereas when burnt the ashes contain potash, which can be spread by grass harrows over the surface, thus supplying a very valuable plant food at a small cost. The grass harrows will expose the eggs and larvæ of many destructive insects as food for birds, and leave the grass plant in the best state to receive the full benefit of the autumn rains and chemical manures. Thus treated, native grasses of the soil will respond beyond the most ardent expectation. It is a fact that, as the years roll on, improved kinds of grasses and fodder plants make a welcome appearance, but these will not maintain their nutritious qualities unless they receive both cultural and manurial attention. At present some people seem to think that in places where some of the good old-fashioned grass will no longer grow it is merely necessary to plant *Paspalum dilatatum*, and all will be well. This grass has exhibited ability to thrive under unfavorable circumstances, but that gives no guarantee that it will go on thriving and escape any fate different to that which has overtaken the other varieties of grass if the same let-it-look-after-itself line is followed.

Pasturage being the mainstay of the Australian pastoral and dairying industries, it behoves all and everyone connected with them to so keep them that they may arrive at the highest efficiency. According to the formula for fertilisers of Mr. F. B. Guthrie, the manure most suited for grasses should contain $7\frac{1}{2}$ per cent. nitrogen, $7\frac{1}{2}$ per cent. phosphoric acid, 9 per cent. potash, and should be applied at the rate of 3 cwt., costing £1 5s. 6d., per acre. This looks like repurchasing the land. There are, however, various ways of reducing this large expenditure. Thus, if a good percentage of clovers are sown in the pastures, nitrogen will be evolved, thus supplying an amount of one of the expensive constituents at a cheap rate; potash, another expensive item, can be supplied by the ashes of burnt refuse, and a top dressing every autumn of Kangaroo guano, of 1 cwt. per acre, costing here about 4s. per acre, for four or five years, will do the rest. Applying chemical fertilisers without first harrowing the surface is to court disappointment, as in all probability it would be washed away instead of being dissolved and carried to the roots of the plants.

Should it be desired to introduce fresh grasses to the pasture, the nature and situation is of great consequence in deciding what should be included in the mixture. In forming a pasture, never do so with a single kind of grass, however well this might answer for experimental purposes. In this mixture endeavor to have grasses coming on at different seasons, thus keeping up as well as possible green bits all the year. Grasses suitable for low-lying country, however valuable and nutritious in their natural habitat, become tough and wiry when grown on poorer uplands. Thus the golden crown grass (*Paspalum dilatatum*), although praised as a strong drought-resisting grass, will only give its wealth of substance when grown in low-lying, damp, situations. There it is a strong-growing self-assertive plant of the greatest value, as it will continue growing during the hottest weather. For lighter soils the English couch, by reason of its deep-rooting and power of reproduction at every joint of the root; Timothy (*Phleum pratense*), smooth-stalked meadow grass (*Poa pratensis*), meadow fescue (*Festuca pratensis*), and sheep fescue (*Festuca ovina*), are some that can be relied upon. On intermediate soils, cocksfoot (*Dactylis glomerata*), perennial rye (*Lolium perenne*), and others are too well known to need recommendation. But in all these the first consideration is the natural habitat of the plant, and is it likely to thrive where it is required. Small experimental plots for grasses are almost useless. They will probably get pampered, or if a small piece is planted to take its chance, the plants are eaten out, root and stump. The best plan I know is to take a plot of two, three, or four acres, fence it in, sow your mixture and give it the treatment you intend for pasture, then compare with the rest.

There was a very short discussion, followed by a varied musical programme.

Conclusion.

It was decided that the next Annual Conference shall be holden at Mount Gambier.

A comprehensive vote of thanks was carried by acclamation.

SILOS.—A correspondent in the *Farmers' Advocate* mentions that twenty years ago there were not twenty-five silos in America; at the present time there are upwards of half a million! The reasons assigned are that a silo enables milch cows to be fed succulent food in winter, instead of hay and straw. There is less waste than is possible with any other system of feeding, and such a saving of time and storage over the system of shocking and housing; furthermore, when feeding ensilage, there is no sudden change of feed, which changes are so readily noticed in the flow of milk.

CENTRAL AGRICULTURAL BUREAU.

MONDAY, APRIL 22, 1902.

Present—Mr. F. E. H. W. Krichauff (Chairman), H. Kelly, R. Marshall, Geo. Quinn, W. C. Grasby, C. J. Valentine, M. Holtze, A. W. Sandford, W. F. Snow, T. B. Robson, and A. Molineux (Secretary).

Flour-testing Mill.

The Hon. Minister of Agriculture intimated that he proposed to have the small flour-testing mill erected at Roseworthy College before next harvest. The Secretary read letter from Mr. W. Farrer, of New South Wales, in reference to the quality of various wheats.

Expenditure of Bureau.

On motion of Mr. KELLY, it was decided to make the next meeting a special call meeting to discuss the financial position of the Bureau.

Apples from Tasmania.

Mr. QUINN tabled specimens from shipment of apples from Tasmania. These apples were all very carefully examined, and in 100 cases they could find no trace of codlin moth, and only a few of the fruits showed signs of mussel scale. If importers kept the fruit anything like the quality of this shipment South Australian growers would need to look to their laurels.

Codlin Moth Regulations.

Mr. QUINN called attention to a letter in daily press from Mr. W. C. Grasby, in which, amongst other things, it was stated that the writer had strenuously opposed the adoption of the regulations, that the Bureau had nothing whatever to do with the regulations, that the regulations had been worse than useless, and that their administration had been weak and unwise. As far as the first two statements were concerned, Bureau records showed that they were incorrect. In 1894 Mr. Grasby moved, at a Bureau meeting, that spraying with Paris green should be compulsory; in 1896 Mr. Grasby moved that the Minister be urged to enforce the regulations against the sale of infected fruit; in May, 1897, while protesting against regulation making spraying compulsory every two weeks, Mr. Grasby moved in favor of three sprayings being made compulsory. In September, 1897, Mr. Grasby moved the adoption of recommendation by Mr. Quinn that spraying be not enforced, but the regulation against the sale of infected fruits be strictly carried out. The Bureau records also showed, as far as he could see, that in every instance regulations dealing with the codlin moth question had been considered by the Bureau before the Minister had them gazetted. Mr. Quinn said he differed from Mr. Grasby as to the regulations having proved worse than useless; and the reference to weak and unwise administration was a reflection on himself, and he would like Mr. Grasby to say in what way it could have been improved.

Mr. GRASBY said he did not intend to reflect on Mr. Quinn; the Ministers to whom Mr. Quinn had to go for instructions were referred to, and he contended that the administration had been both weak and unwise. It was not denied that the moth had spread very rapidly of late, and that was proof that the regulations had been worse than useless. As a matter of fact there was little doubt that in some instances infected fruit had been thrown in clean gardens with the deliberate intention of spreading the pest. Growers in infested districts had been heard to threaten to spread the pest to districts where the growers were advocating the prohibition of the sale of infested fruit. Mr. Quinn had admitted that he had not absolutely a free hand in the administration of the Act. The Bureau had been held responsible for what was really a political matter, and he said without hesitation that the head of the department had been too weak to allow his officers to take action as common sense dictated. As to motions alleged to have been moved by him, he could not deal with these without looking up the matter.

Mr. SANDFORD said he had seconded a resolution on more than one occasion on the strength of the advice given by their expert officers. The members were bound, in matters of this sort, to be guided by those who made a special study of the subject, and they would not refuse to accept the responsibility for doing so.

As Mr. Quinn had to leave the meeting, it was decided to postpone the discussion till next meeting.

The SECRETARY pointed out that Mr. Quinn was bound to say "no" to Mr. Grasby's questions as to having a free hand. Every officer was necessarily bound to consult his Minister, and to consider the amount of money voted by Parliament for any special purpose. Apart from this, however, he had no hesitation in saying that the Minister had not interfered with the actions of Mr. Quinn in regard to enforcing the regulations.

Rust-resisting Wheats.

Mr. MARSHALL stated that a wheat was referred to often in the *Journal* as Phillis' Marvel, and sometimes it was stated to be Marshall's No. 3. This was not correct. Several years ago he gave to Mr. Phillis, of Georgetown, some seed of a wheat he had selected, and which he afterwards called Marshall's No. 4. Mr. Phillis had afterwards grown and distributed this variety under the name of Phillis' Marvel. It was quite different to Marshall's No. 3, and was inferior in its resistance to rust. He did not grow the wheat (No. 4) for long on this account.

New Members.

The following gentlemen were approved as members of the undermentioned Branches:—Angaston, Mr. Jos. Rundle; Caltowie, Mr. Chas. Jettner; Port Broughton, Mr. A. E. Button; Lipson, Mr. E. D. Swaffer; Kingston, Mr. J. Cooper; Millicent, Mr. A. E. J. Hutchesson; Mount Remarkable, Mr. F. W. Baeker; Mount Pleasant, Mr. Vincent Tapscott; Johnsburg, Mr. M. E. Redden; Eudunda, Mr. E. T. Pfitzner; Yorketown, Mr. Clem. Anderson; Mount Compass, Mr. A. Bishop; Meadows, Mr. A. Stevens; Cherry Gardens, Mr. Walter Gardner; Forest Range, Mr. J. Vickers; Stansbury, Mr. Alick Agnew; Crystal Brook, Mr. W. Hutchison; Pyap, Mr. F. Thiele; Kingston, Mr. G. J. McBain; and Dowlingville, Messrs. Jos. Rooney and J. T. Whittaker.

Reports by Branches.

The SECRETARY reported receipt, since previous meeting, of eighty-nine reports of Branch meetings.

REPORTS BY BRANCHES.

Forster, March 20.

Present—Messrs. A. Johns (chair), J. Johns, F. Towell, W. Johns, E. Schenscher, and John Johns (Hon. Sec.).

HON. SECRETARY.—Mr. John Johns was appointed Hon. Secretary in place of Mr. Schenscher who resigned the office.

PLOUGHING IN SEED.—Majority of members did not favor ploughing in the seed, except on new land and then not deeper than 2in. or 3in.

Port Pirie, March 22.

Present—Messrs. T. Johns (chair), H. B. Welch, W. Smith, T. Bell, H. Williams, T. Gambrell, J. Lawrie, T. Jose, F. Humphris, G. M. Wright, E. J. Hector, and T. A. Wilson (Hon. Sec.).

EXHIBITS.—The Chairman tabled about twenty varieties of wheat, mostly new, some being crosses obtained by Mr. W. Farrer with India and Manitoba varieties. He intended to further test them before speaking definitely as to their merits. He described them as follows:—

1. Yandilla; very flinty, 65lbs. per bushel. Drilled 2lbs. seed with English super, at rate of 60lbs. per acre, yielded 40lbs. seed stripped and winnowed. Grew quickly, with leaf like barley, and showed a green tinge within four days; although cut off by drift sand several times it came away again quickly. Can recommend it for sand drifts. It is rust-resistant, quite as early as Gluyas, stands up well, has a hollow white straw.

2. Majestic, 63½lbs. per bushel. Rust-resistant. Drilled 60lbs. on one and a half acres with 60lbs. English super. per acre. Yielded four bags seed. Does not come away well, but does well towards the end of the season, and is late wheat.

3. Ranjit, 62lbs. per bushel. Drilled 50lbs. seed on one and a quarter acres. Got a little less than three bags, and is earlier than Majestic.

4. Silver King, 64lbs. per bushel. Drilled 60lbs. on one and a half acres. Got a little less than four bags. Is earlier, has large grain, is liable to rust, but is the best of the second, third, and fourth for this district. Seed was sent out by Central Bureau.

5. Long Tom; own selection. Grows long straw, slow and weakly at first, does well at last. Is good for hay, rust-resistant, a good milling wheat.

6. Marshall's No. 3. Grown it for seven years, and is the only one retained of nine varieties received at that period from Central Bureau. One year it was the only crop he had. Sowed ninety acres last year, and it yielded more than any other. It came away too slowly, so had not much chance against drift sand.

7. Milne's White Straw, 63½lbs. per bushel. Local selection, like Majestic, but a little earlier. Got forty-one bags off twelve acres; put twice through winnower. Is quite rust-resistant, but rather late, same as Dart's Imperial; would recommend it.

Members generally agreed that late wheats yield best; but both early and late wheats should be sown—the late first. It was considered too risky to drill in seed and manure together on dry land; better wait for rain. Dry sand is best to mix with damp super.

PICKLE FOR WHEAT.—Hon. Secretary mentioned that formalin could be purchased locally for 6s. per pound in quantity, and the cost would be about 3d. per bag. Members are quite satisfied with bluestone.

Port Broughton, March 24.

Present—Messrs. W. R. Whittaker (chair), A. H. Dolling, Jas. Bates, E. Dennis, E. Gardiner, G. E. Pattingale, A. Button, J. Harford, and Jas. Barclay (Hon. Sec.).

POULTRY-KEEPING.—*Re* best breeds to keep. Members consider Brown and White Leghorns and Black Spanish are the best for laying, and to avoid disease and vermin the houses should be movable, and strict attention should be paid to their feed, water, shading, and other requirements.

HARVESTERS.—Mr. Gardiner had harvested 270 acres, and Mr. Dolling 840 acres, and they stated that by using complete harvesters there was a great saving in labor and a saving in grain. There were no losses through damp, sandy floors, rainy weather, sprouting of seed, or dirt or stones getting mixed with the wheat. The sample is better than that by the stripper and winnower. There are fewer hands required to harvest crops with the harvester, and this entails less work for the farmer's wife and daughters in cooking, &c. Both speakers did all the harvest work without hiring outside labor.

Wilmington, March 24.

Present—Mr. J. McLeod (chair), J. Schuppan, J. Zimmermann, J. Hannigan, J. Lauterbach, and R. G. S. Payne (Hon. Sec.).

EXPERIMENTS IN WHEAT-GROWING, &c.—The scheme initiated by Mr. T. Burgoyne, M.P., for assisting farmers in the drought-stricken districts to put in small areas with wheat during the coming season was discussed, and a resolution was adopted expressing the willingness of members to heartily co-operate with Hawker, Quorn, Hammond, and Carrieton Branches in carrying the idea into effect. The Hon. Secretary reported that about £10 had already been collected, and that the sum of £120 had been passed over from the Central Committee, through Mr. Burgoyne, to assist the efforts of the Northern Committee.

POULTRY DISEASE.—Mr. Schuppan said his wife had cured swollen heads and inflamed eyes amongst her fowls by treating them with a mixture of oil and carbolic acid.

Booleroo Centre, March 24.

Present—Messrs. W. Michael (chair), N. Clack, J. Murdoch, J. Repper, W. Brooks, S. T. Parsons, W. H. Nottle, Dr. Steven, J. Michael, G. Sargent, A. Milne, J. Albinus, T. McMartin (Hon. Sec.), and three visitors.

HORSE-BREEDING ON THE FARM.—The Hon. Secretary read a paper to the following effect:—

He considered that all entire horses used for hire should be first examined by a competent veterinary surgeon to ascertain if they are sound and fit, and that those which pass should have a certificate or licence. This would do away with a lot of the mongrels and would bring about an improvement in the breeds of horses. In breeding draught horses on the farm employ the best-bred draught stallion procurable. His pedigree should be traceable back to pure draught stock. Some people contend that pure draughts are too heavy for general farm work; but it is a pleasure to work them if they have pure breeding, and they can be worked on the farm until they are ten or twelve years old, and then sell at good prices for road work. Mongrels may do the work on a farm for a time, but they cost just as much to breed and feed, and they are worth next to nothing when they are to be sold off the farm. But it is not enough to have the use of a first-class draught stallion; the mares must also be selected to suit them, and they should not be aged. Too many farmers work the mares whilst in their prime, and when they get too old for work they start to rear a few foals from them. Foals from young mares are far more to be preferred. A member of one of our Branches stated that the draught stock of to-day is as good as they were thirty years ago, but he (Mr. McMartin) would like to know where they are to be found—except, perhaps, an odd team on the show ground. When the good colts have been produced they must be well cared for and well fed whilst growing, and then there will be no trouble in breaking them into work. At any time it will be easy to sell them at a good price.

Roadsters also pay well to breed, but there is more difficulty in breeding them, chiefly from want of knowledge as to the best cross. Some people think an active draught mare crossed with a blood horse will give a good roadster, and this may happen sometimes; but he preferred a good roomy blood mare mated with a good, flat-boned, active, well-bred, draught entire. This first cross will be fit for farm, trolly, or any other work. From this cross select the best fillies and put them to an upstanding good-quartered blood entire, and the progeny will, with proper schooling and breaking, develop a class of horse that will be pleasant to ride or drive, or will command good prices if offered for sale.

Several members agreed with the ideas put forth by the Hon. Secretary, but some feared that licensing of stallions offered for hire would interfere with the liberty of the subject. Most were agreed that medium draught horses are best for the farm. Mr. Nottle had started horse-breeding from a mare that used to run in a Cobb & Co.'s coach team, and now, by careful breeding, he had a good stock of horses. Dr. Steven said he thought there was not as much in-and-in breeding in the Clydesdale district as there is in South Australia. Mr. Murdoch had some experience in breeding Clydesdales and cavalry horses. The Clydesdale mare and blood horse cross gave the best type of cavalry horse. The Chairman and Mr. Nottle thought if a licence or certificate were made necessary before an entire could be used on hire it would result in an all-round improvement in our horse stock, and would not be too great an infringement of the liberty of the subject.

Scalps Bay, March 22.

Present—Messrs. A. Newbold (chair), W. J. Thomas, George H. Newbold, E. R. Atchison, J. J. Roberts, D. P. Thomas (Hon. Sec.), and three visitors.

INCREASING THE USEFULNESS OF THE BUREAU.—Members think that a column in the *Journal of Agriculture* devoted to questions and answers would be of value, because many questions are answered by letter to individuals which if answered also through the pages of the *Journal* would impart information which is required by many others.

RED RUST.—Quite two-thirds of the wheat crops in this district were ruined by red rust. Marshall's No. 3, Budd's Rust-resistant, Gluyas, and Early Para were the least affected here, but in the eastern portion of the district (about twenty miles away) a mixture of Purple Straw and Rattling Jack produced a sample weighing 63lbs. The red clay flats are more exempt than the light sandy lands.

OFFICERS.—Officers were thanked. Mr. J. J. Roberts was elected Chairman and Mr. D. P. Thomas re-elected Hon. Secretary.

Appila-Yarrowie, March 31.

Present—Messrs. P. Lawson (chair), J. C. W. Keller, J. Wilsdon, J. H. Bottrall, J. Daly, E. Catford, W. C. Francis, R. H. Grant, G. A. A. Becker, C. G. F. Bauer (Hon. Sec.), and two visitors.

SHEEP DISEASE.—Messrs. Bottrall, Lawson, Wilsdon, Keller, and Bauer each have had sheep affected by some complaint. They went lame in the fore feet, and some of them died. When removed to another paddock they recover if not too far gone. [Mr. Valentine says, "Probably the cause is acute indigestion, with impaction in some cases. The cause is probably long continuance on dry innutritious feed. The preventive is change of feed—a little ensilage if possible. Give affected sheep a little Epsom salts, and let all sheep have free access to a mixture of common or rock salt with a little sulphate of iron mixed."—Gen. Sec.]

Lipson, March 22.

Present—Messrs. S. F. Potter (chair), H. Brougham, Jas. McCallum, G. Carr, A. B. Wishart, Jas. Brown, Chas. Provis, and E. J. Barraud (Hon. Sec.).

CURING MEAT.—Mr. Potter stated that 18lbs. salt, 6lbs. sugar, $\frac{1}{2}$ lb. saltpetre, $\frac{1}{2}$ lb. carbonate soda, $\frac{1}{2}$ lb. allspice in 16galls. of water made a very good pickle for curing meat; without the water the above quantities were equally good for dry curing.

TIME TO SOW.—Mr. Wishart wished to know whether the middle of April was too early to sow wheat in this district. Members considered it best to sow in May, but recognised that most farmers must commence earlier. It was better and safer to sow before May than in June.

FALLOWING.—Mr. Potter strongly advocated fallowing; have one-third of the land each year in crop, one-third in grass, and one-third fallowed. Members thought this the best practice to follow, but small farmers cannot always carry it out.

Redhill, March 24.

Present—Messrs. R. H. Siviour (chair), C. Brown, S. H. Treloar, A. A. Robertson, R. T. Nicholls. D. Steele, F. Wheaton, A. E. Ladyman, W. Stone, and J. N. Lithgow (Hon. Sec.).

EXPERIMENTS WITH WHEATS.—Members were of opinion that when wheats are sent out by the Central Bureau the Gen. Secretary should advise as to where and with what success they had been grown previously. Several samples of last season's crop were tabled. King's Early, Carmichael's Wonder, Carmichael's Eclipse, Early Para, and Baroota Wonder were considered the best of those tabled, the rust appearing too late to do them much damage. Carmichael's Eclipse and Early Para appear to be losing some of their popularity owing to the straw being rather weak. Purple Straw and Dart's Imperial were badly affected by rust this season; but members hold the opinion that they are good wheats to grow. Smart's Early, grown in another district, was also tabled. It is well spoken of, being early and rust-resistant, and will be given a trial here this season. Members are of opinion that the kind of land to be cultivated must be taken into consideration when sowing, and that the late varieties of wheat should be put in first and the early varieties about the middle of May.

Yorketown, March 22.

Present—Messrs. J. Koth (chair), A. Jung, C. Domaschensz, H. Hughes, J. H. Thomas, and John Davey (Hon. Sec.).

CROSS-FERTILISING WHEAT.—A member said the best way to cross-fertilise wheat is to sow two varieties in parallel rows, so that the pollen from one will fertilise the other when the plants are in flower. [This can very rarely happen, because the work of fertilising has already occurred when the "flowers" appear. Wheat is self-fertilising, and it is necessary to open the chaff a few days before the "flowers" appear. Remove the male or pollen, and a day or two after introduce pollen from the other plant. The seed from this "cross" will produce several distinct sorts of ears, and the grain from these will again do the same. The approved type must be selected from these for several years. If they do not produce more than one or two varieties it is probable that the cross-fertilisation has been a failure.—GEN. SEC.]

IMPROVEMENT BY SELECTION.—The Hon. Secretary said wheat can be improved by continuous selection. Before the whole crop is dead ripe some of the

earliest and best ears should be selected, and the grain sown in nursery plots. From these plots the earliest and best ears should be selected for re-sowing into larger beds, until enough of the improved seed is secured to sow a field.

EXHIBIT.—Mr. Jung tabled sample of a saltbush from Victoria. The plant had been cut down twice this summer, and was now vigorous and producing seed. It had not been watered.

SOFT-SHELL ALMONDS.—Mr. Thomas wanted to know why his dozen or so of soft-shell almond trees flower well but produce no nuts. [Probably because there are no other varieties near by. Blocks of fruit trees of one sort only often fail to produce fruit satisfactorily. If too much exposed to wind, especially prevailing winds, almond and other trees fail to set fruit. Provide windbreaks.—**GEN. SEC.**]

Kingston, March 1.

Present—Messrs. W. W. Pinches (chair), T. Redman, H. Fraser, T. R. McCulloch, T. Pinkerton, G. Bird, B. Clarke, E. Goode, W. Barnett, R. Flint, H. Threadgold, and F. S. Wight (Hon. Sec.).

AGRICULTURAL BUREAU.—Mr. Redman read paper describing the development and history of the Agricultural Bureau.

PHOSPHORISED POLLARD.—A discussion took place on the mixing of phosphorus and pollard; principally as to whether it was best to melt the phosphorus in hot water or dissolve in bi-sulphide of carbon. The advocates of each method were satisfied that good and safe results were secured, but on a vote being taken the majority were in favor of the hot-water method.

Baroota Whim, March 22.

Present—Messrs. F. H. Flugge (chair), C. F. Bessen, T. Simper, J. McDougall, and C. W. Hoskin (Hon. Sec.).

WHEAT EXPERIMENTS.—Mr. Bessen tabled sample of Marshall's Hybrid wheat. From 4ozs. sown in 1900 he obtained 7lbs. of seed; this, sown last year, yielded 55lbs. The wheat did well right through the dry weather, and the sample was good. It was grown on sandy soil, and he considered it a suitable variety for this district.

Reeve's Plains, March 21.

Present—Messrs. W. H. George (chair), J. G. Folland, J. Dawkins, Henry Day, Hubert Day, W. Cawrse, A. Arnold, W. S. Corden, M. Richter, W. S. Payne, W. Day, J. McCord (Hon. Sec.), and several visitors.

FRUIT-GROWING.—Mr. Payne read a paper on growing fruit on the farm, to the following effect:—

In this district where fruit-growing is seldom practised and usually regarded as impracticable, a few remarks on the subject may not be out of place. He could scarcely believe there was a farmer present who has not got upon some part of his farm a more promising piece of ground for fruit than that upon which he had to deal. When he was preparing the ground a neighbor consoled him with the news that it was no use trying to grow trees, as the rainfall was insufficient, and even if they did make a start the white ants would soon play havoc with them. He found the ground full of white ants, and the soil so dry that it seemed as though there had been no rain for years; the ground was so hard that it seemed as though there had been no rain for years; the ground was so hard that it had to be broken up with pick and bar. Still he persevered, and for years past had from about a dozen trees gathered each year more fruit than they could consume in the house, and it

was rarely that he had not fruit that he could gather. Encouraged by his success, a neighbor had planted a considerable number, but after making a splendid start they had all died out, although the conditions of soil and climate were the same. Every excuse or reason but the correct one was found for this by the farmer in question. Mr. Payne was of opinion that practically every farmer could grow enough fruit for his household, and he only required twelve to eighteen trees. Select a piece of ground sheltered from the north, and with an eastern aspect if possible, a sandy loam with a good clay subsoil was best. Take out holes 3ft. or 4ft. square, removing the surface and breaking the clay in the bottom to a depth of about 9in. On almost pure sand he had splendid trees growing; here he mixed about two loads of clay in the sand, more with a view to giving the tree something to hold to than anything else. He would always put a burrow-load or two of made-up soil, rotted manure and sandy loam, on the surface to prevent the soil caking after rain. Plant the trees as soon as possible after they are removed from the nursery, cut back all broken roots, spread the roots well in the hole, and give some water to settle the soil around them. Cut back any branches that are too long and thin out any that are not wanted. Drive in three stakes round the tree and put baging around all but the eastern side; this he found very important if good growth is desired. Stir the surface of the soil occasionally, and before the summer sets in mulch round the trees, but not right against the stem. Keep the land well worked during the summer. For the farmer, four apricots, two early and two late ripening kinds; two peaches, pears, apples, and plums, an early and a late kind in each case; a fig, and a quince, will make a fair selection. More can be planted if greater variety is desired, and the land is available. He made a practice of pruning out cross branches and keeping the centre open. In respect to drying fruit he could not do better than refer to the article by Mr. T. B. Robson, which could be obtained from the Central Bureau Office.

Mr. Folland had tried several times to grow fruit, but the trees all died out by degrees; he believed faulty drainage was the cause. The Chairman said his small fruit garden was of great value to him; the fresh fruit was most acceptable and healthy. He always dried a few raisins, but did not dip them. He favored planting early varieties of fruit, as they would be ripe before the very hot weather set in. He did not think mulching necessary; keeping the surface of the ground stirred during the summer prevented the escape of moisture and did not afford a harbor for insects like mulch. Mr. H. Day said peaches and apricots would do well there, also figs. He believed that it would pay farmers to grow fruit for the house. After further discussion it was resolved that, "In the opinion of this meeting it is advisable to grow fruit for home consumption."

Bute, March 18.

Present—Messrs. W. A. Hamdorf (chair), J. H. Barnes, F. Trengrove, A. Schroeter, H. Schroeter, J. H. Brideson, E. Ebsary, W. H. Sharman, M. L. Stevens, and A. Sharman (Hon. Sec.).

WORK OF THE BRANCH.—Letter from Gen. Secretary read, mentioning that only one item worth publication had been contained in all the reports of the latest six meetings of the Branch. Mr. J. H. Barnes said the blame rested with the members [who are all practical men.—GEN. SEC.], who failed to bring forward and discuss practical matters. He also said the Gen. Secretary could be reminded to always report important matters—such as that relating to the wheat-testing mill that had been purchased by the Department of Agriculture, but left unused for some considerable time. [The Gen. Secretary did everything within his power to secure the setting-up of the testing mill.—GEN. SEC.]

FALLOW.—M. F. Trengrove said early fallow always produces the best returns, but he thought the fallow should be well worked with harrows, &c., through the springtime, or feeding down with sheep was good for cleaning off the weeds and improving the fields. Not more than one crop should be taken off during three years. Mr. Barnes said farmers would need double the area of land in order to carry out the idea of only one crop. Mr. Brideson said his

land would soon drift on to his neighbor's property if he were to fallow; but on suitable land he favored fallow, and preferred to clean it with sheep rather than to work it with implements, as he thought this caused takeall. Mr. Ebsary advocated early fallow, well worked, as this would give better returns than fallow just ploughed and not worked.

STICKY SUPER.—Mr. Ebsary inquired whether beach shells or sand would be injurious if mixed with sticky superphosphate to make it run through the drills more easily. Members thought it would be good for the purpose and beneficial to the land.

EVERGREEN HEDGE.—Mr. Barnes had found that African Box Thorn grows slowly and loses its leaves in this dry locality; but would be pleased to know of a suitable hedge plant. [Try *Tamarix gallica*, which will grow readily from cuttings if planted during July and attended to whilst becoming strongly rooted. There are probably other locally indigenous plants that would do, such as native pine (*Callitris robusta*), the cones of which should be laid on loosened soil where the seeds will drop out and grow.—GEN. SEC.]

Dowlingville, March 21.

Present—Messrs. J. Phelps (chair), R. A. Montgomery, T. Illman, G. Mason, J. Burkin, F. Lock (Hon. Sec.), and two visitors.

RUST-RESISTING WHEATS.—Mr. Phelps had no experience with rust-resisting wheats in rusty years; he believed in a quick-maturing wheat, such as Smart's Pioneer, as they often escape injury from rust. Mr. Illman had been growing rust-resisting wheats for many years; one season he sowed a bag of Ward's Prolific on thirteen acres, and reaped fifty-nine bags. In one bad season he got 8bush. per acre from this wheat, while other varieties grown alongside were badly rusted. Ward's Improved had also done well, and he favored Smart's Pioneer, owing to its early maturing qualities. Ranjit was free from rust, earlier than Steinwedel, and did well. Mr. Mason did not think it advisable to give up the soft-straw wheats altogether. Mr. Burkin had grown Ward's Prolific, and it did well, but the best rust-resisting wheat he had seen was Gamma, a variety raised by Mr. W. H. Hawke, of Artherton. Mr. Montgomery said Smart's Pioneer had had a good trial throughout the district, and it proved fairly reliable. Carmichael's Early was also a reliable rust-resisting wheat. Marshall's No. 3 was also favorably commented on.

SUGGESTIONS FOR IMPROVING BUREAU.—Mr. Grasby's paper was discussed. Members did not favor any alteration in the constitution or mode of working the Bureau.

Mundoorra, March 21.

Present—Messrs. J. J. Vanstone (chair), C. Button, W. J. Shearer, J. Loveridge, W. Aitchinson, W. Mitchell, W. D. Tonkin, J. Blake, A. E. Gardiner (Hon. Sec.), and one visitor.

STOCK COMPLAINT.—Mr. Button reported having lost five head of cattle, some in full milk and in good condition, from a complaint stated to be influenza. The animal when first noticed was standing with back drawn up and a discharge running freely from the mouth. It appears unable to chew its cud, the throat swells and is much inflamed, and the animal is unable to swallow. They lie down quietly after a time and die with little or no apparent pain. On being opened the lungs were found much inflamed.

USE OF FERTILISERS.—One member held the opinion that by continued use

of phosphates they would spoil their land, as the larger crops removed constituents that they were not replacing. He noticed that he did not get the same result now from these manures as he did when he first used them. The majority of the members, while admitting that the larger crops secured by the use of manures naturally removed more from the soil, contended that with proper cultivation, the growing of different crops, and an occasional rest the land would not be injured. Mr. Vanstone found oats did well on land that was apparently wheatsick, and recommended that they should be grown more as a rotation crop.

PICKLING WHEAT.—Some members make a practice of adding salt to the bluestone solution for pickling, as they think it is beneficial; but the majority held that the addition of salt was unnecessary as the bluestone pickle was sufficient.

Holder, March 22.

Present—Messrs. J. Rowe (chair), J. Jones, J. Green, F. G. Rogers, J. Rossiter, W. Tuck, H. Vaughan, and H. Blizzard.

DRYING RAISINS.—Mr. Rogers stated that he found the ordinary drying trays held about 18lbs. of grapes, which would dry to about 7lbs. of raisins.

WHEAT EXPERIMENTS.—The Hon. Secretary forwarded report on experiments during past year. Owing to the drought the experiments with manures and varieties of wheat were failures. Formalin and bluestone solution were both effective in preventing bunt; hot water treatment was only partially successful.

MANURES FOR VINES.—Members wish the General Secretary to advise as to best manure for vines on River Murray soils. [Impossible to say; will to a large extent depend upon soil and treatment. Experimental work in this direction is much needed.—GEN. SEC.]

Nantawarra, March 19.

Present—Messrs. J. Nicholls (chair), T. Dixon, jun., E. J. Herbert, A. F. Herbert, A. L. Greenshields, J. W. Dall, G. Belling, S. Sleep, and H. J. Spencer (Hon. Sec.).

RAISING SUGAR GUMS.—Mr. Dall reported that he found the method of raising sugar-gum trees from seed, described by the Hon. Secretary (see page 1009, *Journal* for July, 1901), very successful. He was sure if farmers knew how easy it was to raise the plants themselves many would do it, as they could set out the plants on any day that it suited them, and they would naturally stand a better chance of success than with trees brought a distance from the forest nursery.

PICKLING WHEAT.—Mr. Dall said it did not appear to be generally known that bluestone could be readily dissolved in cold water if it is suspended in a piece of bran bag just below the surface of the water. The Hon. Secretary reported on results of some experiments in pickling last season. A hand-threshed sample of Baroota Wonder wheat was secured; some were sown dry and others sown after rain. Clean seed sown dry was quite free from bunt, as was the same seed sown after rain. Seed artificially infected and pickled in a solution of 2ozs. bluestone to the gallon of water showed only one plant bunted out of 227 plants grown in the dry plot, and five infected plants out of ninety-two plants on plot sown after rain. Artificially infected seed sown without pickling produced badly bunted crop; in the plots sown dry more than half

the plants were infected, while on the plots sown after rain there were only ten clean plants out of ninety-one that matured. The majority of members were convinced that pickling with bluestone was a preventive of bunt.

FEEDING OFF CROP.—Some discussion took place on experiments at Mount Templeton school in respect to the feeding down of cereal crops during the winter. Most members did not favor feeding the crop down, and all agreed that where the practice was adopted the sheep should be removed not later than end of July in this locality; also that, if fed down, sheep were the best stock to put into the crop.

Saddleworth, March 14.

Present—Messrs. J. H. Frost (chair), W. H. Bec, D. H. Adams, G. Bengier, J. P. Daley, J. H. Eckermann, W. Hannaford, F. Plant, F. Pluckhahn, J. Scales, R. Townsend, F. E. Waddy, F. Coleman (Hon. Sec.), and two visitors.

TESTING WHEAT.—Members do not consider the method for testing weight per bushel of wheat by measuring and weighing very small samples is at all satisfactory.

EXPERIMENTS IN WHEAT-GROWING.—Mr. R. Townsend mentioned that he had visited Mr. R. Marshall's wheat plots near Adelaide, where varieties had been sown at harvest time (on December 23), and under irrigation, were in every stage of growth, from the tillering up to nearly ripened grain.

TWO CROPS IN ONE SEASON.—The Chairman stated that he had once reaped a crop of 6bush. per acre in April, owing to a thunderstorm having occurred just after reaping a good crop about Christmas.

PLANT GROWTH.—Mr. D. H. Adams read the following paper on this subject:—

There is much similarity between the first food of plants and that of animals in the manner in which the food is stored up for the young plant or animal in the initiatory stages of its existence. In the one case the food is stored up in the seed, while in the case of birds and the feathered creation in general the food is stored up in an egg. In each case nature provides a sufficiency of the necessary constituents for the growth and sustenance of the young plant and animal until it is able to "fend for itself." Both warmth and moisture are required for the preparation of the foods of plants and animals. In the one instance nature provides that the mother gives the milk warm, while the same unerring nature also provides the necessary chemical constituents to warm sufficiently the substance of the seed to enable it to germinate and develop into the plant. And this store of food in a seed is a very remarkable and interesting feature of nature's workings. In it are comprised all the kinds of chemical ingredients necessary for the production of plant food in such a form as is required for the young plant. The carbon in the seed uniting with the oxygen from the air generates the necessary warmth to cause germination and the developments of the embryo plant into the growing plant. In the seed are stored up in a condensed and compact form carbon, hydrogen, oxygen, nitrogen, and traces of sulphur and phosphorus. Besides these there are various salts, starches, and sugars, besides vegetable acids and pigments, all of them necessary for the complete preservation of the plant food and for its preparation for the needs of the young plant. When the three necessary conditions for germination—water, air, and warmth—are all present and germination commences, various chemical changes take place in respect to the various elements of the plant food. And just in the same manner changes take place in the soil in respect to the food of plants. Various combinations and separations are constantly going on and in various ways plant foods are being prepared in the soil. The various substances comprised in plant food are stated by Cousins to be: Necessary foods—water, nitrates, phosphates, sulphates, lime, potash, magnesia, iron, and oxygen, all derivable from the perfect soil, and carbon derivable from the air; while other additional foods are soda, chlorides, silica (flint). These different substances acting and reacting upon each other form a vast variety of food stuffs for the plant to feed on. Now, where do all these foods come from? Professor Wrightson puts it very graphically in this form:—"The soil is a storehouse, a laboratory, and a vehicle." First, a "storehouse," in which the plant food is kept till wanted by the plant; secondly, a "laboratory," in which the chemical changes take place in the inorganic and organic constituents by the physical forces aided by the countless myriads of bacteria present in the soil, causing the nitrification and decomposition of our manures; and thirdly, a "vehicle," by which these soluble substances are brought to the plants, so that they may find

in the soil that which they want in proper condition, and plenty of it near at hand to their roots. The various soil constituents may be divided into soluble and insoluble materials. It is only the soluble ones that are active and available for plant food. A list of the soluble constituents of soil will be found to be very similar in character to that given as elements of plant food. They are potash, phosphorus, lime, soda, magnesia, sulphur, iron, silica, and chlorine. All these elements are found in various forms and combinations in a perfect soil. Some of them dissolve in water, while others dissolve in the sap of the plant. It is worthy of note that in every case, except that of chlorine, oxygen enters into chemical union with the element and forms a rust or oxide of the substance. What a lesson this fact is, that an open porous condition of soil is necessary to a proper preparation of plant food in the soil. In addition to the list of soil ingredients mentioned above, must be added as available foods carbon, hydrogen, and nitrogen in gaseous forms. It is necessary to note that the mineral or organic foods just mentioned are not taken into the sap of the plant as they are. They are mixed with other substances, much in the same way as we mix our cakes, bread, and other foods of mankind before eating them. Yet if we do not have all the ingredients we are unable to make the cake to perfection or the bread to our satisfaction; and in just the same way, in a sense, if all the necessary plant food ingredients are not present in the soil the plant suffers from lack of proper nourishment. There is the additional disadvantage to the plant that it cannot get about in search of a fresh supply of food ingredients as animals are able to do; it can only send its roots where able to force their way. Mr. Jerome Harrison, F.G.S., gives a formula for making plant food, having all the various substances required for a perfect food in their proper quantities. This is the formula:—"Place a small bone on a clear fire and allow it to remain until the 'gristle' has burnt away; remove it and grind to powder. To 300grs. weight of the powdered burnt bone add half a pint of water and then some nitric acid until the bone is dissolved (a gentle heat will assist in this); dissolve a little carbonate of potash in water and add it to the dissolved bone until the mixture looks rather thick or turbid; add also of nitrate of potash 170grs., of sulphate of magnesia 107grs., of chloride of potassium 40grs., and of water enough to make the whole up to a quart. We have now a strong or concentrated solution of mineral substances which we shall find to be a most valuable plant food. To use it we must add two tablespoonfuls of the strong solution to 1qt. of pure water, to which add also one drop of a solution of perchloride of iron. In this way the quart of concentrated plant food will yield 16galls. of diluted plant food fit for use." If we put an acorn in some pure sand which is not soluble plant food—and keep the sand moist with this diluted plant food we shall find it grows rapidly. It is quite possible to grow it in a jar or bottle, suspending the plant by passing it through a hole in the cork and filling the bottle once a week with the dilute mixture. The outside of the bottle should be painted or covered with a piece of paper or other material to shade it, as all roots of plants like best to feed in the dark. It will be seen by a careful study of the various ingredients in Harrison's "ideal" plant food that it contains all the various substances generally stated as the requisites of growing plants. It will be interesting to note the figures given by Harrison as to the quantities of food stuffs taken from 100 acres of land by a fairly heavy growth of wheat, that is, the mineral matter removed by an ordinary good crop of wheat.

	In the Corn.	In the Straw.	Total.
	lbs.	lbs.	lbs.
Potash	749	1,821	2,570
Soda	97	90	187
Magnesia	307	411	718
Lime	86	934	1,019
Phosphoric acid	1,147	815	1,962
Sulphuric acid	8	582	590
Silica	84	10,182	10,266
Per-oxide of iron	20	132	152
Common salt	3	33	36
	2,500	16,000	17,500

It will be seen that of the several substances used by the wheat plant silica is used in the greatest quantity, while potash comes next, and phosphoric acid is third. Now, as ordinary soil is composed very largely of silica, especially clayey soils—clay being a silicate of alumina, with usually a certain amount of iron, besides silicates of potash and other combinations of the mineral silicon—it is not often that a soil is found to be deficient of the most used ingredient of plant food—silica. But potash is often scanty, and needs to be added to the soil in order to make complete plant food. And more especially is it the case that phosphoric acid is present in sufficient quantity to fully make up the required supply for the growing crop. By

a wonderfully wise provision of nature, the soil is continually being replenished with phosphoric acid, as that substance is always a product of nature's workings in respect to the decay of dead plants and animals, and from animal excreta, besides being present in rock formation, generally in the form of phosphates a union of phosphoric acid with a base—very often lime. Hence it is that the farmer uses various phosphatic manures to supply a deficiency in any particular spot which has not had a sufficient amount placed there by the various workings of nature, or because of the fact of the soil having become exhausted of the supply by producing heavy crops. As is very well known now, various processes are used for the preparation of this kind of plant food, so as to add it to deficient soil in the form most easily taken up by the growing plant; and very many forms of the valuable constituents of plant food are discovered and used in various parts of the world.

Leaving the soil for the present, the plant food derived from the air next claims attention. And is it not a wonderful provision of nature which provides one of the most necessary as well as one of the most used of the plant foods in the shape of carbonic acid, which is sent into the air by every living animal, through every pore of the body, as well as in every breath sent out? Besides this, every dead animal, as well as vegetables, restores its carbon in the form of carbonic acid gas, to be taken up and used again by growing plants, and so assist in building a fresh structure. Like most of the greatest blessings, this one is generally unobserved, except by the scientist or student.

Professor Ville, in his book on "Artificial Manures," says that carbon comprises 47.69 per cent. of the whole composition of wheat (straw and grain). So that nearly a half of the total amount of the composition of the plant is derived from the air in the shape of carbon, while oxygen (also from the air) comprises over 40 per cent. of the total.

And the manner in which carbonic acid works in respect to the growth of plants is marvellous in the extreme. The carbonic acid is taken into the plant by means of the leaves, much the same as oxygen is taken into the lungs of animals. Webb, in his very interesting and instructive book on "Agriculture" says:—"The manner in which carbon is withdrawn from the atmosphere and stored up within the leaf is one of the most wonderful things in the chemistry of nature, although apparently the process seems simple enough. Carbonic acid gas passes through the stomata, or small openings on the under surface of the leaf, traverses the intercellular spaces, and comes in contact with the green chlorophyll granules. With the aid of sunlight, which supplies the energy to do the work, the chlorophyll decomposes the carbonic acid gas, retains the carbon, and gives out the oxygen. The carbon is then combined with the elements of water to form starch, which is the first visible product of assimilation. The small starch granules can be detected under the microscope by a drop of iodine in solution, which turns them blue."

Webb says, further:—"The amount of carbon removed from the atmosphere during a season may amount to several tons an acre. The greater the leaf surface the more carbon removed; as, for example, the Jerusalem artichoke, with a leaf area of fifteen times that of the soil covered, was found by Professor Ville to fix 3 tons 4 cwt. of carbon per acre, while beetroot, with a leaf area one-third that of the artichoke, absorbed 16 cwt."

The manner in which plants act in respect to the absorption of carbon, and the giving out of oxygen at night, as well as the transpiration or giving out of aqueous vapor, would necessitate a special article, and the study of those points, although not coming strictly within the limits of this paper, would be extremely interesting and instructive.

Mount Bryan East, March 29.

Present—Messrs. A. Pohlner (chair), J. Thomas, J. Wilks, E. Wilks, G. Taylor, J. Honan (Hon. Sec.), and two visitors.

WHEAT EXPERIMENTS.—Mr. Wilks tabled samples of Clubhead and Gamma wheat from Bureau seed. He received 20z. of each, and from the crop got 130z. of the former and 150z. of the latter variety. The grain was fairly good and the wheats free from bunt, the seed being pickled in lime water. Other seed picked with bluestone solution was somewhat affected by bunt.

LUCERN.—Mr. Thomas wished to know best time to sow lucern, and what manure to use. Members could not answer, as they had no experience in growing lucern. [In localities where night frosts are neither early nor severe the seed may be sown in April or May. Some people have been successful when sowing half a bushel of wheat or other cereal with lucern seed. In frost-liable districts sow lucern towards end of September. Soil should be worked down as fine as for an onion bed.—GEN. SEC.]

Kanmantoo, March 21.

Present—Messrs. Thos. Hair (chair), Jno. Downing, R. Downing, W. Mills, F. Hair, Thos. Hawthorne, J. Hair, F. Lehmann (Hon. Sec.), and one visitor.

PICKLING SEED WHEAT.—Discussion on this subject took place. Mr. Mills reported result of experiment with five bags of badly bunted Steinwedel wheat. He pickled it in bluestone solution in a tub, floating off the bunt balls. Half the seed was dried and put away for a month, and then sown. There was very little bunt, and a yield of 20bush. per acre of good marketable wheat was obtained. The other half was allowed to dry, then a little later again pickled and dried; this produced a crop quite free from bunt, but more than a third of the seed failed to germinate. Mr. Downing said his father always pickled with lime, and was never troubled with bunt; the lime was also of decided benefit to the young plant. Mr. F. Hair said that in England a pickle of urine and lime was successfully used to prevent bunt. A question was raised as to whether lime or salt used in pickling wheat would re-act on super. applied with the seed. [The risk of injury in this way is very remote. Nearly all soils contain considerable quantities of lime, and the little salt left on the grain where salt water is used in pickling would be harmless.—GEN. SEC.]

Richman's Creek, March 24.

Present—Messrs. A. Knauerhase (chair), F. Mattner, J. M. Kelly, E. Roberts, A. Nicholson, W. J. Wright, J. A. Knox, J. McSkimming, J. J. Gebert, J. McColl (Hon. Sec.), and one visitor.

SUGGESTIONS FOR IMPROVING BUREAU.—After much discussion, it was agreed that the Central Bureau as constituted is doing good work; but, if any alteration is considered to be necessary, the Branches should have a voice in the election of the members. Members are unanimously of the opinion that the number in the membership of Branches should not be increased.

VISIT TO WESTRALIA.—Mr. J. McColl gave a lengthy report upon his recent visit to Westralia.

Bowhill, April 5.

Present—Messrs. J. T. Gregory (chair), F. H. Baker, J. Waters, A. R. G. Dohnt, F. A. Groth, N. P. Noonan, J. G. Whitfield (Hon. Sec.), and one visitor.

SUPERPHOSPHATE.—Mr. Noonan asked whether in the event of the seed lying in the ground for a long while before germinating, owing to the absence of sufficient moisture, the super. was likely to lose in strength. [Very unlikely. Unless there was a fair amount of moisture in the soil very little change would occur in the super. — GEN. SEC.]

WASTE ON THE FARM.—Mr. Groth read a paper on this subject, dealing principally with the waste of seed. He pointed out that a single grain of wheat, producing four heads, each containing forty grains, meant a return of 160 grains for each grain sown. Four stools to a plant and forty grains in each head was not a high average under favorable conditions. How was it, then, that we sow so much and reap so little? First, half what we sow does not germinate, owing to being cracked or otherwise injured; some grains are killed by bluestone pickling, which also retards the growth of others; then many rot in the soil owing to want of proper conditions. One of the greatest faults was in not having the land in proper condition. This was a question of serious moment to farmers. Say 48bush. of seed is sown; does one-fourth

grow and come to maturity? When the quantity of seed sown and the number of plants that a given area of land will support are taken into consideration it is seen that there is a very serious loss somewhere. Seed wheat should be cleaned as thoroughly as possible to remove all small and broken grain, weed seeds, &c., which would be better fed to horses, pigs, or poultry than put in the ground to rot. Members considered that Mr. Groth has greatly overestimated the loss of seed.

Gladstone, March 1.

Present—Messrs. J. Gallasch (chair), J. Smallacombe, J. Rundle, J. Sargent, J. Shepherd, C. Gallasch, W. Brayley, G. M. Growden, E. Coe, and W. A. Wornum.

WORKING THE SOIL.—A discussion on this subject took place, members being of opinion that whenever possible the land should be worked when damp. Cases were instanced where better returns had been obtained from a thorough scarifying of the land than from ploughing. Several members advocated hand-pulling of stinkwort. Where manure is placed on the land before seeding it is considered essential that the land should be free from weeds, otherwise they get too much of a start on the wheat.

CONCENTRATED SUPER.—Members decided to obtain for trial half a ton of concentrated super.

RED RUST.—Discussion on rust-resistant wheats took place. Members were unable to name wheat of proved rust-resistant qualities, as what are free one season are badly affected the next, and some generally considered liable to the disease escape injury. Marshall's No. 3 was mentioned by one member; a portion of a crop across a watercourse was badly rusted, while the rest of the paddock was quite free. Dart's Imperial, a wheat liable to rust, had in some cases given from 25 bush. to 28 bush. to the acre, while equally promising looking crops of the same wheat had only yielded half as much. Marshall's No. 3, Petatz Surprise, Smart's Early, Budd's Rust-resistant, and King's Early were highly spoken of, but reports as to their behaviour were very conflicting, and it was resolved that no wheat in the district had consistently withstood the ravages of rust, though the early-maturing varieties had on the whole turned out best.

Lyndoch, March 27.

Present—Messrs. H. Kennedy (chair), F. Warren, W. J. Springbett, H. Springbett, and J. Mitchell (Hon. Sec.).

EXPERIMENTS WITH WHEAT.—Mr. W. Rushall reported World's Champion to be a good yielder, very liable to red rust; sown late in a place favorable for rust. Gamma, rust-resistant, good milling quality; sown late, somewhat blighted.

Burra, March 14.

Present—Messrs. F. A. S. Field (chair), F. G. Dawson, A. McDonald, E. Goodridge, F. Duldig, J. A. Arnold, Joseph Flower, and R. M. Harvey (Hon. Sec.).

OFFICERS.—Officers were thanked, and Messrs. F. A. S. Field and R. M. Harvey were re-appointed Chairman and Hon. Secretary respectively.

WHEAT AND MANURE EXPERIMENTS.—Mr. Joseph Flower exhibited samples of wheat from seed supplied by Central Bureau. Clubhead and

Gamma, $\frac{1}{2}$ lb. of seed of each, sown June 20, 1901, with super. at rate of 100 lbs. per acre. Clubhead yielded about $\frac{1}{2}$ lb. grain, Gamma about $\frac{1}{2}$ lb.; both samples badly rusted. Other wheat sown around the above under same conditions yielded 9 bush. per acre, of good sample. Mr. A. McDonald reported that he had sown Clubhead and Gamma alongside Leak's selected Redstraw. They did not compare well with Redstraw during growth, were much affected by red rust and dry weather, and the sample was very inferior. Redstraw gave a much better sample than Purple Straw, Hogben's Surprise, or Hybrid under the same conditions, and seems to be well suited to this district. Purple Straw, sown in nine-acre plots, on fallow, and manured with varying quantities of Alkali Co.'s super., yielded as follows:—With 75 lbs., 13 bush. per acre; 125 lbs., 16 bush.; with 170 lbs., 16 bush. The wheat manured with 170 lbs. super. appeared throughout the growing season likely to more than pay for the heavier dressing, and with a more favorable ripening season would have been the more profitable crop. It is intended to use 170 lbs. per acre on most of the wheat crop this season.

Onetree Hill, March 21.

Present—Messrs. J. Bowman (chair), A. Adams, G. Bowman, J. Flower, J. Hutchens, A. Thomas, and J. Lucas (Hon. Sec.).

DEATH OF SHEEP.—A member reported that the death of two of his sheep was preceded by blindness. They had come from a considerable distance north, and it was thought that death may have been caused by cold. Where a film over the eye has been occasioned by dust or other contact, powdered sugar has been found an effective remedy.

FODDER PLANTS.—English clover has been successfully grown at Woodside, and in similar cool localities having fair soil and rainfall. Mr. Thomas said ryegrass does well on the creek flats on his land. Artichoke, variegated and other thistles, if cut young and left on the ground, are eagerly eaten when dry by stock.

WOOL AND LAMBS.—Mr. G. Jeffrey's lecture was discussed appreciatively. Success with early lambs depended upon locality and season. A paddock should be reserved for feed; and, with a plentiful supply of water, lambs would do well on a good supply of dry feed. Where a market is convenient, it is certainly advantageous to buy ewes instead of breeding them, unless wool is a specialty. The rearing of ewe lambs to breed from involves cost of keep without an adequate return. Over-classing of wool is decidedly a mistake; but judicious classing must be insisted upon, as a little carelessness or looseness might damage the sale of a season's clip. In breeding for wool it is of great importance to have due regard for constitution and frame. Weak or small sheep can carry too much wool.

Golden Grove, March 20.

Present—Messrs. R. Smith (chair), W. Bartle, J. Woodhead, A. Harper, F. Buder, J. Rawlins, J. McEwen, A. Robertson, S. A. Milne, and J. R. Coles (Hon. Sec.).

TAKEALL.—Mr. Bartle read a paper on "Takeall." A general conclusion as to its cause seemed to have been arrived at when the matter was discussed at a congress held in Adelaide, but no remedy has been suggested. He had noticed it at times all over the State, and in all classes of soil and all varieties of wheat. It seems to be due neither to disease nor to poverty of soil. Years ago, when he was a lad, there was a patch of about two acres affected with takeall; and,

as it was expected to be a failure, it was decided to "handle" a lot of young horses upon it. They were attached to a log, and plunged all over the spot. The crop recovered, and they cut quite two tons of hay per acre off that piece. On a paddock similarly affected next year they trampled it down, when the soil was wet, with 200 sheep, with good effect. He thought takeall was a result of imperfect tillage. Owing to the loose spongy nature of the soil the plant fails to keep a grip, gets delicate, and succumbs to cold or frost. A Yorke's Peninsula farmer told him takeall is due to fallowing, and the only way to get a crop was to let the land lie out of cultivation for two years, get a good burn, and then plough up wet. He advised him to fallow and get the seed in wet. Next season he ploughed, left fallow, and then sowed on a wet seedbed, the result being a 25-bush. crop—much better than anything else he had. Many farmers had thought that the drill would end the trouble; but something must be added to it to bring about the desired effect. Some American drills have a small wheel or presser behind the seed hoe, which seems to be an improvement. The remedy will be found in a method of applying pressure in a small compass whilst the soil is wet. The bearing surface on a roller is too great. A weighty implement, with narrow discs or wheels running separately, will probably be effective.

EXHIBIT.—Mr. Smith tabled samples of seeds of tall holcus and dhurra.

Hartley, April 5.

Present—Messrs. J. Stanton (chair), W. Klenke, J. Jaensch, A. Jaensch, W. Kutzer, W. Cross (Hon. Sec.), and one visitor.

TAKEALL.—Members have little experience of this complaint. Mr. Reimers stated that he had ploughed land laid down to lucern for twenty-five years and sowed wheat broadcast, with the result that nearly the whole of it was destroyed by takeall; the second year it was even worse, only a few wild oats surviving. Another piece was sown, in 1900, with oats—all but half an acre, on which wheat was put; the wheat suffered from takeall, but not the oats. Last year the whole paddock was sown to wheat. On the portion on which the oats were grown previously he cut 2 to 2½ tons of hay per acre, but the other piece was again badly affected.

HON. SECRETARY.—Mr. W. Cross was appointed Hon. Secretary in place of Mr. B. Wundersitz, who resigned owing to ill health.

Burra, April 11.

Present—Messrs. F. A. S. Field (chair), R. J. Needham, Jos. Flower, Jas. Scott, J. A. Arnold, A. McDonald, E. Goodridge, F. Duldig, and R. M. Harvey (Hon. Sec.).

POULTRY.—Some discussion took place on question of price for sittings of eggs or young birds of pure-bred poultry. Mr. Duldig considered that the best cross for farmers' poultry was the Plymouth Rock and Andalusian; the progeny were good layers and large birds for table purposes. Mr. Scott found the Indian Game and Dorking cross very satisfactory.

IMPROVING THE USEFULNESS OF THE BUREAU.—In order to have a definite subject for discussion at each meeting, it was decided to make each member responsible for a paper during the year. Papers for June and July meetings were arranged.

Wandearah, March 24.

Present—Messrs. Geo. Robertson (chair), W. Roberts, T. Joyce, L. Stanley, A. W. Davidson, E. Jacobs, E. H. Eagle, W. Munday, G. Collins, C. E. Birks (Hon. Sec.), and one visitor.

STANDARD SAMPLE OF WHEAT.—Considerable discussion on this subject took place, and a resolution favoring a permanent standard of 63lbs. per bushel was carried.

MEMBERSHIP.—Members were in favor of increasing the limit to twenty-five.

Mount Pleasant, April 11.

Present—Messrs. G. Phillis (chair), J. A. Vigar, P. Miller, jun., J. Maxwell, H. Drogemuller, W. Lyddon, W. Royal, J. A. Naismith, J. F. Miller, F. Thomson, and H. A. Giles (Hon. Sec.).

MEMBERSHIP.—It was resolved that this Branch is of opinion that fifteen members is ample for any Branch.

WHEAT EXPERIMENTS.—Mr. Vigar tabled several samples of wheat. Leland, the product of seed received from the Branch, was much affected by rust on the straw, but the grain was very good. Steinwedel grain was badly pinched; also Tuscan, from seed grown near Mount Barker. Tuscan from seed raised near Gawler produced a very fair milling sample. A long discussion took place on the peculiar way the crops had been affected by red rust this season. Mr. J. F. Miller sowed four acres with Blount's Lambrigg and five acres with Tasmanian Purple Straw. The land was very even as to condition and situation, was quite level, and sown at same time. All the crop was more or less affected by rust. Blount's Lambrigg returned four bags per acre, four acres of the Purple Straw yielded three bags per acre, and the other acre only one bag per acre, though there was nothing to account for the difference in yield. The Hon. Secretary grew Gluyas Early, and it was quite free from rust; he intended to sow 100 acres of it this year. The crops in the district were nearly all more or less affected by rust, the grain in the majority of cases being pinched and useless for milling.

Morgan, March 29.

Present—Messrs. R. Windebank (chair), H. Hahn, E. Hausler, H. Wohling, R. Wohling, W. G. F. Plummer, and one visitor.

WIRE-STRAINING.—Mr. Windebank initiated discussion on this subject. Until he read an article comparatively recently, pointing out the advantage of long strains, he had always held the opinion that short strains were best. He had tried now both long and short strains, and found that the latter were soon made loose by stock, but the long strains give more with the pressure, but come back to their original tautness. Several other members related their experiences in this matter, all demonstrating that long strains were best.

Colton, April 5.

Present—Messrs. P. P. Kenny (chair), E. Whitehead, M. S. W. Kenny, H. A. Kleeman, W. J. Packer, W. A. Barnes, and R. Hull (Hon. Sec.).

WET AND DRY CYCLES.—Paper read at Crystal Brook Conference was discussed, members generally being of opinion that the rainfall records were proof of the impossibility of forecasting the weather with any degree of accu-

racy for more than a short time in advance. The reading of the paper led to short discussions on various subjects connected with the conservation of soil moisture.

DEATH OF STOCK.—Members were of opinion that losses of cows in this district were not entirely due to disease, but also to the eating of rabbits poisoned by phosphorised pollard.

SHRIVELLED GRAIN FOR SEED.—Mr. P. Boyton wished to know what amount per acre of seed that had suffered from rust should be sown? [Half a bushel, if sown during May, more if later.—GEN. SEC.]

Johnsburg, March 22.

Present—Messrs. G. H. Dunn (chair), L. Chalmers, J. Sparks, T. Potter, J. Caughlan, F. W. Hombsch, F. W. Smith, and T. W. Johnson (Hon. Sec.).

IMPROVEMENT OF BUREAU.—Mr. Grasby's paper was discussed. Members consider the Branches should remain as they are, particularly in respect to limitation of membership. It was agreed that if reading courses or lectures could be carried out it would be of considerable advantage, also the circulating library—as the young people might be got hold of, which at present was a difficult matter. The question of alteration of constitution of Central Bureau also met with approval.

Meadows, April 14.

Present—Messrs. W. Pearson (chair), T. B. Brooks, J. Catt, G. Usher, G. T. Griggs, G. Ellis, J. Usher, W. J. Stone, F. W. Dohnt, W. Nicolle, D. D. Murphy (Hon. Sec.), and two visitors.

CODLIN MOTH.—A long discussion took place on this subject, some members being in favor of the removal of all restrictions on the sale of "wormy" fruit. It was resolved that this Branch is of opinion that if a seller declares his fruit to be infested he should be allowed to sell it. It was also decided to bring the matter before the parliamentary candidates

Millicent, April 3.

Present—Messrs. H. F. L. Holzgreffe (chair), H. A. Stewart, H. Warland, W. B. Crouch, R. Campbell, B. Varcoe, S. J. Stuckey, G. Mutton, A. McRostie, and E. J. Harris (Hon. Sec.).

SOUTH-EASTERN CONFERENCE.—Matters in connection with the recent Conference of Branches were dealt with. Mr. Campbell referred to drawbacks in regard to these conferences. With seven Branches a conference could only be held in each locality once in seven years, unless some of the localities were ignored. Then, owing to question of travelling, when the conferences were held at Tatiara, Lucindale, or Millicent, several of the Branches could not be represented. It would be better to have two conferences annually, one in connection with Mount Gambier, Penola, and Millicent, and the other in connection with Tatiara, Naracoorte, Lucindale, and Kingston Branches. It was decided to ask the Branches interested to consider the matter.

PESTS AND DISEASES.—Mr. Whennen sent in apples badly affected by scab (*Fusicladium*), and was advised to spray with Bordeaux mixture when the flower-buds swell in spring. Mr. Warland expressed the opinion that pruning and cultivation accelerated the spread of diseases, and instanced an orchard near Mount Barker that was never pruned or cultivated, but was free from

diseases and pests. Mr. Harris said he had never seen orchards in a worse state than some he saw round Mount Barker, whose owners evidently did not consider cultivation or pruning necessary. Mr. Varcoe showed leaves of *Dolichos* badly affected by scale. The Chairman referred to spread of stinkwort. Mr. Varcoe said the grass should be allowed to grow amongst the stinkwort, and, when the latter was just coming into flower, run a fire through. In three seasons he had cleared affected land. Mr. Mutton said ploughing under before it seeded got rid of the stinkwort and benefited the soil.

PRESERVING ROPE AND WIRE.—The Chairman said he made a practice of putting new ropes in hot fat for about ten minutes, as when so treated they lasted much longer than usual. Mr. Stuckey said wire was improved by the same treatment.

Mount Compass, April 12.

Present—Messrs. R. Peters (chair), F. Slater, R. Cameron, J. Jenken, W. Gowling, E. C. Good, F. McKinlay, A. Sweetman, S. H. Herring, C. S. Hancock, A. J. Hancock (Hon. Sec.), and one visitor.

MANURES FOR CABBAGES.—Discussion took place on best manure to apply to cabbages during growth. Mr. Cameron had best results from application of super. and sulphate of ammonia when the plants are commencing to heart. Mr. Gowling agreed; but liked to use super. in water as a liquid manure.

ADVANCEMENT OF THE DISTRICT.—Discussion took place on best means of advancing the prosperity of the district. Mr. Cameron suggested that the Government be asked to carry out experiments to determine what could be profitably grown on the sandy lands, of which there was an immense area in the district. Mr. Gowling suggested that Mr. Thos. Hardy be asked as to suitability of these sandy lands for vines.

BRANCH SHOW.—On March 31 the first show of products of the district was held. The exhibition was very successful, a large number of exhibits of vegetables of all descriptions, dairy produce, jams, preserves, &c., being tabled. No prizes were offered, nor were the exhibits judged, the object of the exhibition being to show what the district could produce. Various implements used in cultivation of the swamp lands were also shown. Visitors from Willunga and Port Elliot Branches attended, and addresses were given by several visitors and members of the local Branch. Members are well satisfied with the success of their first exhibition, and it is hoped to make it an annual affair.

Clare, April 11.

Present—Messrs. W. Kelly (chair), S. C. Bray, C. J. McCarthy, C. Harsman, R. Martin, H. Adams, A. P. Birks, S. Smith, and W. S. Birks (Hon. Sec.).

EXHIBITS.—Mr. McCarthy tabled cluster of Louise Bonne de Jersey pears, there being seventeen pears on the branch.

FORAGE CROPS.—Discussion on fodder crops for autumn and early winter feeding took place. Barley, rye, rape, and mustard were considered good for early feed for sheep and cattle, and it was agreed that more attention should be given to these crops in this district. The Hon. Secretary was trying a mixture of rape and mustard on land cropped for hay last year; the stubbles were scarified and the seed harrowed in. Rye was considered one of the best for early feed, as it grows rapidly and makes a large quantity of good solid green feed. Lucern should be sown after the first rains, in early autumn or

in the spring, when there is not much danger from frost. The land should be thoroughly prepared beforehand, and too much care cannot be taken to secure a good seedbed; fallowing is considered necessary. Good results have been secured by drilling in the seed.

CODLIN MOTH.—Mr. McCarthy referred to the necessity for close examination of the forks of the trees in affected gardens; he found the forks a favorite resort of the caterpillars. It was also necessary to scrape the loose bark on old trees off the upper limbs, as well as the trunk and lower portions.

Yorke town, April 12.

Present—Messrs. J. Koth (chair), C. Domaschensz, A. E. Anderson, C. H. Davey, B. Lloyd, R. Newbold, G. Bull, and John Davey (Hon. Sec.).

COST OF WHEAT-GROWING.—Estimates submitted at meeting of Rhine Villa Branch were discussed. Members thought the cost set down for the different operations in growing an acre of wheat were out of proportion, and it was decided to discuss the matter further at next meeting.

Brinkworth, April 4.

Present—Messrs. A. L. McEwin (chair), A. W. Morrison, C. Ottens, H. J. Welke, G. Wooldridge, J. Cross, J. Stott (Hon. Sec.), and three visitors.

WATERING HORSES.—Mr. Wooldridge read a paper on this subject. He advocated watering the working horses before feeding; they should have water at least three times a day. Horses will not eat their dry feed when thirsty. He noticed that when fallowing and working their horses seven or eight hours without water they got thin. Care must be exercised in watering light horses when travelling. Give a little water and often is the best, as they do not then scour. Most members water their horses before feeding and some allow them water afterwards as well. Some believed in letting them have water whenever they wanted it. Only one member opposed watering before feeding.

Endunda, April 1.

Present—Messrs. J. von Bertouch (chair), F. W. Paech, R. Kluske, J. A. Pfitzner, and F. H. Wolter.

EXPERIMENTAL WORK.—Messrs. Pfitzner, Wolter, and Kluske appointed as a committee to conduct experimental work with manures and seeds.

INCREASING USEFULNESS OF BUREAU.—It was considered advisable to postpone discussion until there is a better attendance of members.

Maitland, April 5.

Present—Messrs. J. N. Smith (chair), T. Bowman, C. W. Wood, H. R. Wundersitz, H. Bawden, J. Kelly, W. Wilson, W. Bowey (Hon. Sec.), and two visitors.

RUST-RESISTING WHEATS.—The Chairman initiated discussion on this subject and read from paper by Mr. R. Marshall. A long and interesting discussion, in which most of the members took part, ensued. Members were agreed as to the necessity for carrying out experiments in the selection and

crossing of wheats, with a view to securing rust-resisting wheats of good yielding and good milling qualities. The necessity for continued selection of good varieties to prevent deterioration was mentioned, and regret expressed that the Department had done so little in this matter. Some members thought that great care would have to be exercised in the growing of the rust-resistant wheats, or South Australian grain would lose its reputation in the European markets, and farmers would have their wheat docked or refused by the wheat-buyers. Mr. Wundersitz thought that it would pay farmers better to grow the ordinary prolific wheats, as rust only came occasionally and the better crops obtained would more than compensate for losses sustained in rusty years. Rust-resistant wheats were not prolific. [This is not correct; there are quite a number of varieties of rust-resistant wheat that yield well and are also of good milling quality. Experiments only will show whether they retain all their good qualities in any particular district.—GEN. SEC.] Mr. Kelly thought that the hot dry weather last spring was more responsible for the injury to the grain on the lighter soils than was the rust. It was decided to try Manitoba wheat in this district.

Mount Gambier, April 5.

Present—Messrs. W. Mitchell (chair), A. J. Wedd, W. Barrows, J. Dyke, T. H. Williams, M. C. Wilson, J. C. Ruwoldt, D. Norman, jun., and E. Lewis (Hon Sec.).

SOUTH-EAST BRANCHES CONFERENCES—Members agreed that it is desirable that the South-East be divided into two districts for the purpose of holding annual conferences, namely, Millicent, Mount Gambier, and Penola to form one district, and Kingston, Lucindale, Naracoorte, and Tatiara the other. They also spoke in terms of high appreciation of the recent Millicent Conference and show of products.

LICE ON SHEEP.—Mr. T. H. Williams read the following:—

The long-wool sheep is the principal host of the sheep louse, though it is occasionally found on the Merino. Recent inspections in the district show that these lice are now beginning to assert themselves in formidable numbers on our long-wools, and it will be well for owners to be on the alert. Frequent and very careful examinations must be made, and should any trace of the parasites be found, the sheep should be dipped at once. Many owners appear to think that if they have dipped their sheep off shears, or soon after, this is all that is required of them; but such is not the case. What is required is that their sheep must be kept free of lice, as well as other parasites; and now is the best possible time to take the matter in hand. I am afraid that a careful inspection would disclose the disagreeable fact that many of the long-wool flocks are more or less lousy. Lice are very difficult to find, and the eggs of the parasite can only be seen with the aid of a glass. Should a few lice be discovered on sheep, it is safe to assert there will be thousands on the animals in a short time. Infested sheep rapidly become poor, and pluck off the best of their wool along the ribs, &c., with their teeth. Surely owners are not going to stand idly by and allow themselves to be beaten, when a reasonable amount of care and timely action will prevent individual and national loss. In New Zealand it has been found on all sides that sheep must be dipped twice a year to keep them free from lice, and only poisonous dips are of any use for the destruction of this parasite, as the properties of carbolic dips are too quickly lost in wet districts. It may be well to point out, for the information of owners of infested sheep, just how they stand with regard to the legal aspect of this matter. They are required, under the Act and regulations, to send a written report to the Inspector of Stock when they have infested sheep. They must not travel infested sheep through runs or along roads, or expose them for sale in any saleyard, whether public or private. Instructions have been given that in future the law on the matter must be strictly enforced, and this will certainly be done.

In answer to questions and expressed opinions, Mr. Williams said the pasturage has nothing to do with the lousy condition of sheep, nor do they become lousy because they are poor. It would be no more absurd to say that the lice breed sheep than to say that the sheep breed lice. It was a mistake to say that only

poor sheep have lice on them. The lice take a large quantity of blood, and thus reduce the sheep to a poor condition; but probably a fat sheep does not so readily supply blood, and the lice therefore breed more rapidly on a poor sheep. They are more difficult to deal with than horse lice. Even when sheep have been twice dipped they often have eggs on the fleece when they are being shorn. If sheep are dipped early in April the wool will hold sufficient dip to carry them on to shearing. When dipped off the shears the effect is very soon lost. He did not think the lice leave the sheep when they get fat in spring. If cattle lice did leave the animals in spring they left their eggs for the following season. They were deposited at the roots of the wool, and when the cattle shed their hair he did not think the eggs were hatched on the ground. No dip could be used hot enough or strong enough to destroy the eggs, but when the parasite was hatched it would be killed. Carbolic acid soon lost its power, but a poisonous dip would retain its virtue until shearing. In the early stages lice generally infested the neck, but in bad cases they affected the whole fleece. He advised a first dipping when the wool had made a little growth after shearing—unless the sheep were lousy at shearing—and then a second dip later on would generally be sufficient.

EXPERIMENTS WITH SUPER.—Mr. Edwards drilled superphosphate with oats on 100 acres near the Snuggery, but a very hot day in November, when the oats began to bell, blighted the crop. He would try it with 130 acres wheat next season. Mr. Wedd had a similar experience. Mr. Dyke and Mr. Barrows thought the failures were due to absence of rain.

Davenport, April 10.

Present—Messrs. W. J. Trembath (chair), J. Holdsworth, W. Penna, F. H. Pybus, W. Hodshon, T. McDowell, A. McDonald, D. J. Brown, W. G. Pryor, and J. E. Lecky (Hon. Sec.).

ALMOND TREES.—Mr. Hodshon, sen., wished to learn why his seven-year-old almond trees do not bear fruit. [Possibly they are too much exposed to prevailing strong wind, or they may be all of one kind and too close together.—**GEN. SEC.**]

NOTES ON PLOUGHING.—Mr. Pybus read a paper to the following effect:—

Some farmers seem to use the scarifier when the plough would be of more benefit. They can get a larger quantity of ground under cultivation with the scarifier than with the plough, but it would be better to cultivate a smaller proportion of land in a systematic way, and thoroughly work and manure it. They would get a better return in the smaller area properly worked than if they merely used the scarifier and seeded a larger quantity. In ploughing, the speed of the horses has a lot to do with the ploughman turning out good work; therefore he should match his horses in their walking paces as well as possible, else some of them are driven beyond their steps, and they then draw unequally, and the ploughman, through that, is not able to hold his plough steadily and the plough has a tendency to take too much ground, to overcome which the ploughman leans the plough over to the left, and it raises a thin broad furrow which lays at too low an angle. If the speed is too slow the ploughman is liable to get into a careless way, thinking of other matters instead of what he is doing, and allows the furrows to become too narrow and shallow, although they may be laid at the proper angle of 45° with the horizon and the work looks neat, but there will still be a deficiency of mould in the plough soil. This alludes more to single and double ploughs, but applies to larger ploughs, but not to so great an extent, as the four or five furrow plough is much wider. The land that is to be ploughed should not be very wet if the soil is of a clayey nature, else when the ridges get dry they form into lumps, which sometimes are difficult to reduce, but, as far as our district is concerned, there is not much trouble in this respect, as the land is too sandy and our rainfall is so little that the ground hardly gets enough to allow the farmer to start ploughing as soon as he would like to. In ploughing, the ridges, whenever the situation will allow of it, should be north and south; but many farmers make their ridges the longest way of the ground, irrespectively of the good they might get by making the ridges north and south, for, if north and south, it allows the sun, which is beneficial to all plants, to get at each side of the ridges, and the whole crop will be more uniform in growth and also ripen at the same

time. In the depth of ploughing most farmers vary a good deal, in one case only allowing 3½ in. Of course, the nature of the soils has a lot to do with it; but Mr. J. Coleman, an authority on farm work, said that there are very few soils that should not be ploughed 6 in. deep, and others up to 8 in. and 10 in. One deep ploughing to the full depth should be given every twelve or eighteen months, and then the scarifier can be used to an advantage, as it allows a firm bottom to be formed, which is beneficial to wheat. Again, at the time of ploughing in the stubble, there is not so much pains taken with it as it deserves to have, for the crop depends a good deal on the way it is done. Some think, because it is only the stubble, any way will do as long as the stubble is turned over; but stubble ploughed in is the making of the soil for the coming crop, and also the opening up of the ground to allow the atmosphere to thoroughly penetrate the soil, which is one of the most essential things for the coming crop. The ploughman should have some knowledge of the land that he is going to work on, so that he may regulate the size of the grips that he will have to make to carry off storm waters, also the height of his ridges; if for a wet district he will allow high ridges, so that the water can get away, and if for a dry district he would allow for low or flat ridges, so as to retain the water as long as possible. If the land is being manured with animal or vegetable manure, it should be ploughed in deeper than if fossil manures are used, as the former always has a tendency to rise to the atmosphere, and the latter, or fossil manure, has a tendency downwards. If farmers would cultivate less ground and work it with the plough more often than some of them do at the present time they would get better returns even with our present rainfall, and at the same time they would be having their fallow ground deriving all the good from exposure to the atmosphere that it possibly could do. As farmers are allowed to take up so much ground, it would be better, even if they got good seasons, to always keep a certain amount of ground unbroken by the plough, so that they would always have the natural herbage—which, no doubt, is best adapted for the class of country—to fall back upon in case of dry seasons. I would like to have some knowledge given to the school children—especially in the country districts, where a great number of them will be the coming farmers in the near future—of farming and classification of the soils, which might be given them in their reading books; as, no doubt, what the children learn while young they remember until of old age.

FOWL TICK TRAP.—Mr. E. H. Messenger forwarded a contrivance for preventing fowl ticks getting on to the poultry when roosting at night. It consisted of a piece of ¼ in. wire a foot long, hooked over 1½ in. at the top end, and furnished with thread and nut at the bottom. A cone of galvanized iron 1½ in. across at top and 1½ in. deep was soldered on the wire at ¼ in. from the bottom, and in this the kerosine is placed. At 5½ in. above the bottom of the wire a ruve or ring was soldered on the wire, to support an umbrella-shaped piece of galvanized iron, 2½ in. across, above the kerosine cone, to keep anything from falling into the kerosine. One of these traps is to be affixed to each end of a free perch by aid of the nut and screw, and the perch is then to be slung to the rafters with wire.

HOW TO MAINTAIN INTEREST IN THE WORK OF BRANCHES.—Mr. Pybus suggested that the Central Bureau should provide a trophy, to be held by the Branch adjudged to have done the best and most useful work for the year.

EXCRESCENCES ON ALMOND ROOTS.—Mr. Hodshon tabled a number of large corky excrescences taken off the roots of one of his almond trees. They were similar in nature and appearance to those which are often seen on the stems where peach trees are grafted upon almond stocks.

Forest Range, April 17.

Present—Messrs. G. Monks (chair), F. Green, E. Rowley, W. Cherryman, J. Green, J. Jennings, W. McLaren, R. Green, J. G. Rogers, F. Mason, R. E. Townsend, A. Green, H. H. Waters (Hon. Sec.), and two visitors.

CODLIN MOTH.—Mr. F. Green read the following paper on this subject:—

It seems rather a superfluity to write a paper on this subject since reading the report on Mr. Sandow's experiments. If he can attain all he claims there is very little need for me to enlarge on the subject. Under these circumstances I think I will deal with the system, or to put it correctly, the want of system in the inspection we find in our market. It is a fact patent to everybody that a gardener can take his infested fruit to the East End Market and dispose of it without running much risk of detection. Cases of apples are sold at every market

where the trouble would be, not to find a few codlin in them, but to find a few apples that were free of them. Where is the fairness of the thing when a man labors all the year to secure a clean crop comes to the market and finds the man who does nothing to secure clean fruit selling his infested fruit in opposition. It makes the careful man think that he might as well have saved himself a lot of work and still made as much money. It is a farce for our inspectors to rush about the gardens trying to compel them to destroy the codlin moth if the market inspectors do not stir themselves to stop the sale of infested fruit in the markets. No one can deny that there has been but very little effort to stop it this season at any rate. In my opinion all the work done by the inspectors in the gardens is undone by the apathy of the inspectors in the markets. True, we hear of a few gardeners being hauled up and fined now and again, but what is it? Where one is fined fifty go free. The risk of detection is so little that gardeners are quite willing to take the risk, and so the sale of fruit infested with moth goes on. If the system of inspection was strict in the markets it would make gardeners endeavor to secure some fruit that would be clean enough for sale. It is the gardeners' own faults if they allow their gardens to be so overrun with the pest that there is no clean fruit left. With the use of prompt and effective measures such as those recommended by the department, coupled with a man's common sense, it is possible to save 75 per cent. and upwards of a crop. This I feel sure is the place where the failure of the system of inspection starts from. So long as the gardener can sell infested fruit with impunity (which undoubtedly he can at present) so long will gardeners neglect to take measures to extirpate it. In bringing this matter before the Bureau my object is, not only to give members a chance of bringing forward their views on it, but to take such action as this Branch may deem advisable to remedy the evil.

The paper was well discussed, members being generally of opinion that more drastic measures were needed to suppress the sale of infested fruit, and a resolution "That it is desirable that the restriction on the sale of infested fruit be strictly enforced in the markets." It was also resolved that in the opinion of the members steps should be taken by the Government to dip or otherwise disinfect boxes, bags, &c., at the markets, it being left to the option of the gardeners to avail themselves of the facilities provided.

Stansbury, April 5.

Present—Messrs. A. Anderson (chair), P. Anderson, C. Faulkner, J. Henderson, G. Jones, J. Sherriff, and P. Cornish (Hon. Sec.).

QUESTIONS.—Mr. P. Anderson wished to learn where the birds go that are present in summer and absent in winter? Referred to General Secretary. [I do not know, but believe they migrate north and eastward.—GEN. SEC.]. He also wanted a cure for sows which eat their young. [Make her fat and kill her; there is very little probability of any other "cure" being effective. Before farrowing, all sows should be fed with nourishing food, but it must not be of a very stimulating nature. A very little salt may be useful.—GEN. SEC.].

BLOAT FROM EATING DRY WHEAT.—Mr. Faulkner recommended a drench of half a bottle each of linseed oil and kerosine for horses that have got at the wheat heaps or bags. Several members spoke well of a tablespoonful of carbonate of soda in a bottle of water as a drench.

WORMS IN PIGS.—Mr. P. Anderson wished to learn how to cure pigs affected by worms. [When the case is bad, give a dessertspoonful of turpentine in half a pint of linseed oil, a few hours later give half a drachm each of sulphur and sulphate of iron in a pint of linseed tea. For mild attacks and for young pigs give a teaspoonful of sulphate of iron in the food two or three times.—GEN. SEC.].

EXPERIMENTS WITH WHEAT.—Mr. Sherriff reported Majestic, a late variety, grew well, tall, strong, rust-resistant, a good grain, yielding from 26lbs. sown a return of 406lbs. Galland's Hybrid, sown late, was a fair wheat, and rust-resistant. He had ten seeds of the Algaroba bean ("Mesquit," *Prosopis* sp.) of which he has six plants now growing. He put the seeds in tins with perforated bottoms for drainage, and watered the soil.

Arthurton, April 10.

Present—Messrs. W. H. Hawke (chair), J. Welch, J. B. Rowe, J. Koch, W. E. Hawke, S. T. Lamshed, M. Lomman, H. T. Freeman, T. Baldock, H. Baldock, W. Short, T. B. Wicks, and C. L. Palm (Hon. Sec.).

HANNA BARLEY.—The Chairman tabled sample of Hanna barley grown by himself; it yielded at rate of 40bush. per acre, and sold for 3s. 9d. per bushel for malting purposes. Members considered result very satisfactory, but thought there was a market for only a small quantity. [Buyers of malting barley say there is a considerable market at fair price for good samples.—GEN. SEC.]

COST OF FARMING.—Mr. Short furnished following estimate of cost of farming on a 1,000-acre farm, cropping 330 acres of fallow each year:—

<i>Outlay.</i>	£	s.	d.
Fallowing 330 acres, at 4s. per acre	66	0	0
Cultivating twice, at 1s. 6d. per acre	49	10	0
Drilling seed and manure, 1s. 6d. per acre	24	15	0
Harrowing, 6d. per acre	8	5	0
Reaping, 3s. per acre	49	10	0
Cleaning, 1s. per acre	16	10	0
Carting, 1s. per acre	16	10	0
Bags and packages for wool and wheat	20	0	0
Carting produce, 1s. per acre	16	10	0
Rent, 1,000 acres, at 1s. 9d. per acre	87	10	0
530bush. seed wheat, 2s. 6d. per bushel	41	5	0
Eleven tons super.	55	0	0
Interest on 300 sheep, £150, at 10 per cent.	15	0	0
Repairs to fences	5	0	0
Shearing 300 sheep	3	0	0
Rates and taxes	6	0	0
Total outlay	£480	5	0
<i>Income.</i>	£	s.	d.
330 acres, 12bush. at 2s. 6d.	495	0	0
Returns from lambs and wool	67	0	0
Returns from pigs, cows, poultry	15	0	0
Total	£577	0	0

Showing profit of £96 15s.

Considerable discussion ensued, eleven members voting in favor of the figures as a fair estimate, and two only being against them.

STOCK COMPLAINT.—Mr. Rowe mentioned loss of horse from some complaint. Severe scouring was first noticed, and then fever appeared to set in. Members thought it possible that the rusty stubbles and dirt picked up when feeding was the cause of the scouring.

Cherry Gardens, April 8.

Present:—Messrs. W. B. Burpee (chair), T. Jacobs, C. Lewis, J. Lewis, H. Strange, G. Hicks, A. Broadbent, J. Potter, G. Brumby, T. Paltridge, and C. Ricks (Hon. Sec.).

DESTROYING BRIERS.—Mr. Potter reported that a neighbor who grubbed out a number of brier bushes last year sprinkled salt on the broken roots left in the ground, with the result that they were killed outright, no growths springing from the roots, as was usually the case.

BRANCH SHOW.—The Hon. Secretary reported that the late show had been a success, and the balance-sheet showed a small amount to credit.

Amyton, April 17.

Present— Messrs. S. Thomas (chair), J. Kelly, R. Brown, Alex. Gray, Wm. Hughes, Wm. Mills, W. Gum, F. Mullett (Hon. Sec.) and two visitors.

EXHIBIT.— Mr. Hughes tabled a poor sample of Clubhead wheat.

CHEMISTRY OF PHOSPHATIC MANURES.—The Hon. Secretary read an interesting paper, founded upon the researches of standard authors, to the following effect:—

Since phosphates are so extensively used, and are practically the basis of all artificial manuring, it is good that farmers should have a knowledge of them and their principles. In the main, phosphatic manures supply phosphoric acid, sulphuric acid, and lime, all most essential elements of a good soil, and likewise present in the best of soils in small proportions, as the following analyses show:—

	Phosphoric Acid.	Sulphuric Acid.	Lime.
Fertile soil.....	·47 per cent.	·90 per cent.	4·9 per cent.
Rich soil.....	·24 “	·09 “	·7·30 “
	* Good loam, 1·28 per cent.		

Now, wheat, wheat straw, and milk make heavy draws on this limited supply (leaving alone that taken away also by the bones of growing stock), to the following extent:—

	Phosphoric Acid.	Sulphuric Acid.	Lime.
25bush. Wheat.....	11·47lbs.	·08lbs.	·85lbs.
3,000lbs. Straw	8·15lbs.	5·82lbs.	9·34lbs.
750galls. Milk	26lbs.		

It will be seen that a 25bush. crop takes 20lbs. of phosphoric acid per acre off the farm when the straw is sold off [1cwt. fresh bones per acre will replace this quantity], and cattle considerably deplete the already limited supply. It is therefore absolutely essential that the phosphoric acid, at least, must be returned in some form or other. Long ago it was found that bones would do this part. Bones contain 53 per cent. of phosphate of lime in the form of tricalcic phosphate, not soluble in water. The three parts of lime which accompany the phosphoric has the effect of making this form of phosphate insoluble. The action of water and the carbonic acid of the air brings about a chemical change to bicalcic phosphate, which is produced by the natural decomposition of bones, and is slowly soluble and acts well. It acts quicker in proportion to the degree of pulverisation before application to the soil, but even then is not quick enough for farmers who want immediate effects. Liebig brought about his system of applying sulphuric acid to the pulverised bones, and accomplishing in a few hours what nature took a long while to do.

This mono-calcic phosphate (commonly called superphosphate) is very soluble. This manure became so much in demand that bones would have gone up to a prohibitive price; but the late Sir J. B. Lawes discovered that superphosphates could be manufactured from mineral deposits of phosphates.

It was early discovered that if superphosphates were held over a season, they went back several units in their percentage of solubility. They were then known as “reduced” superphosphates, and in this form were actually preferred by many practical farmers who tried them. But superphosphates are sold on their percentage of solubility. Farmers were not willing to pay on the basis of a percentage that once existed, and manufacturers were also unwilling to sell on the basis of the “reduced” percentage, and lose the value of the insoluble phosphate which it contained. The “battle of the gauges” was waged, and now manufacturers find it cheaper to use a few extra gallons of sulphuric per ton to ensure the percentage being maintained, and wise farmers “reduce” their own on some plan, as, mix 1 ton of crushed bones with 2 tons super.; let them heat together in a heap. In five or six weeks the mixture is in good condition. The solubility of the bones has been increased, and that of the super. decreased or “reduced.” One farmer obtained as good results from 27s. 6d. expended this way as with 40s. worth of super. with ten loads farmyard manure added. The explanation may be given that phosphate as sold in the form of “super.” does not exist naturally in the soil, and it may therefore be called an “unnatural” product. “Reducing” tempers it, and the farmer sees the action of “an old friend” in its work.

Phosphates in application should be scattered as much as possible. Confining it in drills means that the roots will practically be likewise confined in the same groove, which is most undesirable in many ways.

Superphosphates are too sudden, especially in dry districts. When the moisture is present they force a big growth, but it is a weak growth in consequence, because forced. When a dry spell sets in, the growth is not strong enough to stand its altered circumstances, and is consequently very liable to mildew, rust, or any other fungus disease which may be, and probably is, present in the air.

Sulphate of lime, or gypsum, the by-product in the manufacture of super., is an excellent manure in itself, especially for wheat. It forms about 50 per cent. of the bulk of the superphosphate of commerce. It attracts moisture from the air, and is likewise a direct food plant.

Seaweed ash, or seaweed ploughed in from a compost heap, or seaweed applied in any form, forms an excellent all-round manure, and for phosphates especially. It may be said to be the only manure used in the island of Jersey.

This paper was discussed. Members had proved that superphosphates applied direct from the merchant had not been in any way a success in this district. The seasons of experiment had been dry ones, and the results had been as stated in the address—a big early growth, and a falling away when the dry spell came, and unmanured crops came out the best. Members expressed their intention of “reducing” in future in this dry district. [Members would do well to exercise considerable caution in “reducing” their super. or they will find their experience dearly bought. South Australian experience with “reduced phosphates” is not in accordance with authorities quoted by the writer of the paper.—GEN. SEC.]

Dowlingville, April 18.

Present—Messrs. J. Burkin (chair), G. Mason, R. A. Montgomery, T. Kenny, S. Tee, T. Lomblad, H. P. Crowell, and F. Lock (Hon. Sec.).

PICKLING WHEAT.—Members are of opinion that it is more beneficial to pickle seed on a floor, sprinkling it thoroughly and turning it until all the seed is wetted, than to dip. Not only does pickling in tub or barrel seem less effective, but it is very much more troublesome. Half a pound of bluestone to the bag of seed is considered sufficient. It was thought best to pickle the seed about two weeks before sowing. Mr. Montgomery thought if they could get out the bunt balls or break them before pickling it would be an improvement, as if they go through the drill they are broken and the seed re-infested. [For this reason dipping the seed is the most effective, the bunt balls can be floated off and removed. Dipping ensures every grain being properly pickled, but pickling on the floor not so certain.—GEN. SEC.]

Kingston, April 5.

Present—Messrs. W. W. Pinches (chair), T. Redman, T. Pinkerton, W. Bennett, E. M. Flint, R. Flint, B. Clarke, H. Fraser, H. Threadgold, and F. S. Wight (Hon. Sec.).

OVER-STOCKING—Mr. T. Pinkerton read a paper to the following effect :—

Over-stocking on grass land has its bad effect in reducing the condition of the animals; but in most of the rough country of the South-East—especially where freshwater teatree swamps exist—the animals not only lose condition, but they are driven, in the absence of palatable and nutritious herbage, to eat of plants which injuriously affect their health, and occasionally cause great loss to their owners. About thirty years ago, the late Mr. R. Stockdale placed about forty-five valuable Clydesdale mares into a paddock to foal. There was a deal of rough feed and a belt of teatree in that paddock. After they had been there two months eight of the mares aborted within a week. The feed had been eaten bare in patches, and a lot of the rough feed and teatree. This, he thought, was the cause of the trouble, and not the sympathetic feeling which some people said is usually the reason. In Baroota fourteen years ago a certain paddock was very much overstocked with sheep and cattle. The cattle ate some of the teatree, and a number of them were affected in the back or kidneys and allied organs, so that several of them died. He did not think paralysis of the hind quarters and impaction were one and the same disease, because he had known fat cattle affected with the paralysis. They eventually became poor and died; but cattle with dry bible are generally poor, though they might be suffering with it for some time before the disease is noticed. Both paralysis and impaction occur at the end of autumn when everything is dried up. If stock have plenty of good grass and clean water there will be very little trouble with either disease.

Wilson, April 19.

Present—Messrs. W. H. Neal (chair), W. H. Neal, jun., H. Need, J. Coombs, J. Rowe, H. T. Crossman, A. Crossman, H. Ward, J. Nelson, A. Smith (Hon. Sec.), and two visitors.

POULTRY TICK.—The poultry tick (*Argas reflexus*) has become a terrible pest in this locality, and members fear that it cannot be exterminated. If such a thing were possible, it would be far more profitable to keep poultry. Even the sparrows and magpies are becoming infested with ticks. Kerosine, tobacco water, scalding the houses and perches, weekly burning of perches, and continued care and cleanliness were all recommended. [Build the fowl-house of galvanized iron, with all the framework outside. Sling the perches by wire from the roof, and fix the kerosine tick traps recently mentioned on to the perches. One is described in present issue in report of Davenport Branch. Or use Mr. Pybus's tick puzzler. If ticks get into the house, remove the perches, place a lot of straw inside the house and set fire to it. The iron will become so hot that neither ticks nor their eggs can resist, and the house will again be clean. Dip each fowl in a cold bath made by boiling two sticks of twist tobacco in a gallon of water for ten minutes, with stirring. That will kill the ticks on them. Do not put their heads in the dip.—GEN. SEC.]

Clarendon, April 14.

Present—Messrs. J. Piggott (chair), A. Harper, A. A. Harper, W. Spencer, J. Pelling, R. Hilton, W. A. Morphett, J. Spencer, J. P. Juers, E. Dunmill, and J. Wright.

KEEPING UP WITH THE TIMES.—Mr. A. Harper read a paper on this subject. He contended that to make things pay the farmer must keep up with the times; everything that will lessen the cost of production must be availed of. Labor-saving implements, improved stock, good seed, proper manures were all essential. They wanted the machines that would do the most work for the least money; the stock that will give largest return for the food they eat; the wheat that will yield best for grain or hay, as the case may be. They must take precautions to prevent weeds being introduced in the seed wheat, and to prevent their crop being reduced by bunt, which can be done by pickling the seed before sowing.

Pyap, April 16.

Present—Messrs. W. C. Rogers (chair), C. Billett, E. Robinson, A. J. Brocklehurst, G. H. Mills, J. Holt, A. Westbrook, J. F. Bankhead, and B. T. H. Cox (Hon. Sec.).

INCREASING USEFULNESS OF BUREAU.—After discussion members agreed to the following ideas:—Reconstruction of the Central Bureau; no addition to number of members of Branch; and favor reading courses, short lectures, circulating library, elementary science classes, and issue of special bulletins.

DINGOES.—Mr. Westbrook reported that wild dogs are abundant in the back blocks.

POTATO PEST.—Hon. Secretary said a small black beetle was attacking potato plants. It was very timorous, and hopped off at first attempt to catch it. Referred to Gen. Secretary for identification. [No "beetle" has reached my hands. There are few "beetles" that hop. Is it possible that it is the black cricket, which is commonly found on reclaimed swampy soil?—GEN. SEC.]

Gawler River, March 21.

Present—Messrs. J. Badman (chair), R. Badcock, H. Roediger, J. Hillier, E. Winckel, T. P. Parker, A. M. Dawkins, and A. Bray (Hon. Sec.).

CULTIVATION OF TOMATOES.—The Hon. Secretary read a practical paper on this subject, to the following effect:—

Not long ago there was practically no market for tomatoes, but now there are very few households where tomatoes are not used during the season. He sowed the seed in shallow boxes, covered with glass during June, in a sheltered place where there is a good light. If the weather is extremely rough and cold, place the seed boxes on a heap of fresh stable manure. When the plants are 3in. high, set them at 5in. apart under glass frames in beds or boxes, not in pots, else they may become pot bound. Do not plant out in the open air until danger of frost is passed—some time in September—unless they can be protected at night. Kerosine tins cut lengthwise make a good shelter, each half will protect one plant. A free, rich, sandy loam, well worked is well suited for tomatoes. It is possible to make the soil too rich, tending to luxuriant foliage and next to no fruit in the early part of the season. Only old manure should be used. This season he applied a little stable manure, and at rate of 8cwt. super. and 1½cwt. muriate of potash per acre; then, after the first crop of fruit was gathered at end of January, applied from 1½cwt. to 2cwt. sulphate of ammonia per acre between the rows when watering. This forced fresh growth and continuous crops till end of the season. When planting out remove plants with soil on roots, plant in rows 3ft. x 3ft., with gutters between the rows for watering. Support the plants with Spanish reeds ("bamboo," or *Arundo donax*), and when 18in. to 2ft. high trellis to a single wire stretched from posts at each end of the row, and stapling the wire to stakes at intervals at a height of 2ft. from the ground. This protects the plants and fruits from many disasters, and tends to perfect maturation of the fruit. Thinning out weak shoots and pinching back promotes early ripening and setting. Save seed from the earliest and finest fruit, as this tends to early fruit next season. Change of seed is occasionally desirable. When the black scab appears (*Macrosporium Solani*), flower of sulphur keeps it in check; Bordeaux mixture is also recommended. "Blindness" (malformed flowers and fruit) so far as been incurable, and it is best to pull the plants up and burn them. Tomatoes require a lot of water, but too much can be given. [Soft water is by far preferable. —GEN. SEC.] Give enough to keep the plants going until they begin to flower; then give them a good soaking twice a month, and break up the surface with a fork-hoe directly it is dry enough after watering.

FEEDING COWS WITH WINDFALL APPLES.—Members would be pleased to know if anyone will give his experience in feeding windfalls and culled apples to cows, and whether the acidity of the fruit would affect the milk.

MANURING VINES AND FRUIT TREES.—In reply to a question, Mr. A. M. Dawkins said that Professor Perkins' opinion was that commercial fertilisers did best when applied in furrows or trenches, but stable manure could be placed all over the ground.

EXHIBITS.—Mr. H. Roediger tabled samples of Gamma and Thiess wheats. Gamma is supposed to be rust-resistant, a good sample, and yielded at the rate of 21bush. per acre. He also tabled sample of Northern Territory beans, which are very prolific, and equal in flavor to French beans.

OFFICERS.—A resolution was adopted that when the Chairman has held office for a year he shall not be eligible for re-election until the expiration of another year.

Saddleworth, April 11.

Present—Messrs. J. H. Frost (chair), D. H. Adams, J. P. Daley, J. H. Eckermann, W. Hannaford, W. Heaslip, J. Scales, F. E. Waddy, and F. Coleman (Hon. Sec.).

SUGAR FROM SORGHUM.—The Hon. Secretary reported having written for a copy of an article by Professor Neale, of Delaware, United States of America, in which he claims to have grown pedigreed sorghum as rich in sugar as the average of sugarcane in Hawaii, and richer than the sugar beets grown in Germany.

POULTRY-FARMING.—Mr. F. Waddy read a short practical paper on this subject:—

For laying fowls I place Leghorns and Minorcas first; for table fowls Langshans and black Orpingtons, as they have the advantage of being good winter layers as well as making large birds. I do not think it pays to grow pure-bred birds, but to cross those already mentioned, taking care to select your roosters and hens from good laying strains. It is well to pick out your best hens, that is for breed, shape, and laying qualities, and put them apart with a selected rooster, setting the eggs from them alone. The best chicks are generally hatched from early eggs, as they come into full laying when eggs are at a high price; also, they grow better and stronger, as they get the best pickings while the grass is green, and also when it seeds. As they grow up weed them out, selling all weakly pullets, keeping the strong ones. I like a short plump hen, quick in her movements, as they lay more eggs in proportion to the food they eat. Galvanized iron houses are the best for fowls; they can be kept clean easier, and will last a lifetime without harboring all sorts of insects and diseases. It is best to have the house small and have several than have one large house, because in case of disease attacking fowls, it is easier to cope with. The chicks when young want keeping away from the other fowls for a time; it is well to have coops in which you can shut the mother while the chicks can go in or out as they will; they do not need anything for the first twenty-four hours, then a little crushed wheat will be found good for them. Feed often, but not much at a time. As they grow up green food is very necessary, and thistles just in flower will be found very good. The older fowls require two meals a day, one of soft food in the morning, and grain in the evening. In the winter it is well to have the soft food warm, and the fowls ought to be fed by sunrise. Boiled barley or wheat is good as well as pollard, crushed wheat, and crushed oats. A little cayenne pepper or ground ginger with bonemeal mixed in their soft food now and again will do a lot of good. If a fowl gets anything wrong with it the best cure is the axe, as a fowl that has once had a disease is rarely much good afterwards. I think in case of disease attacking fowls it is well to kill the ailing ones and try to prevent any more catching it. For selling poultry I find it a good plan to dispose of all hens of three years old just before wheat harvest, as they fetch a fair price then. I do not advise anyone to grow fowls for the table, as it is not the size of the bird but the profit we want, and a small rooster about half grown will turn in more, in proportion to their feed, than a large one. Sell the young roosters before they worry the hens, as they will then fetch about 1s. 3d., and if kept till full grown only about 1s. 9d. to 2s. at the outside, and during that time they eat a great deal of food. It is a good plan to have a portable fowl house to put your young roosters in and take them about in the stubble after harvest. One year I covered an old roller with bags and moved it about in the stubble, and in that way reared a nice lot of birds for market. Another handy thing is a coop for shutting up clucky hens in until they will keep off the nests.

In discussion, the ringing of fowls legs or cutting off the tip of toenail to distinguish difference in age was advised. Shelters to keep fowls warm when roosting paid; it saved food. Some members considered at present high prices of butchers' meat it was better to eat than sell the old hens. [Boil one for an hour and then bake for an hour, and it will be quite tender.—GEN. SEC.]

RUST-RESISTING WHEATS OF GOOD MILLING QUALITY.—The following varieties were mentioned:—Marshall's No. 3. Federation, Plover, Bobs, and Jonathan. The Hon. Secretary read an extract from notes on some of these by Mr. W. Farrer, of New South Wales. Federation came from a cross between Purple Straw and Yandilla, the latter by crossing an Indian variety on improved Fife; a sample of Federation recently milled produced a high percentage of flour of excellent color and texture. Its strength was appreciably higher than that of the flour of Purple Straw; the latter will make about 282lbs. of bread from 200lb.-bag of flour, whereas the flour of Federation would make 289lbs. of bread. Plover is a little stronger in the flour than Purple Straw, practically the same milling qualities, and contains three-quarters of the blood of Purple Straw; it has been bred with the object of making a rust-resisting Purple Straw. Bobs, the outcome of a cross Nepaul (skinless) barley on a wheat, gives flour of very good color, not yellow, and of a strength very little under the average of Manitoba wheats. Jonathan yields a flour of excellent color and of slightly higher strength than Bobs; would bake about 306lbs. bread, against 311lbs. of an average Manitoba wheat.

"DRY BIBLE."—Mr. Scales disagreed with Inspector Dowdy's advice to avoid powerful purges; he had used heavy doses with satisfactory results where lighter ones had failed.

BEST CROP OF TWENTY ACRES WHEAT.—In connection with prizes offered for best crop of twenty acres of wheat, open to all farmers in the district, a series of questions designed to give full information as to the growing of the contest acreage to be answered by competitors was approved.

Crystal Brook, April 19.

Present—Messrs. J. C. Symons (chair), P. Pavy, W. Hamlyn, G. Davidson, W. J. Venning, E. Dabinett, R. Pavy, G. M. Davidson, and F. S. Keen (Hon Sec.).

MANURING GRASS LANDS.—Discussion took place on offer of Department of Agriculture to supply manures for experiments in the manuring of pasture lands, several members offering to carry out the tests.

HOME-MADE SUPER.—Mr. Dabinett stated he had manufactured super. for his own use for the past six years, and finds that it gives better plant growth than purchased super. sown alongside. [If Mr. Dabinett would explain how to make the super. this item would be of some considerable value to other members of the Bureau.—GEN. SEC.]

CARE OF SHEEP SKINS.—Mr. P. Pavy read from Mr. G. Jeffrey's book on "Wool-classing, &c.," article on "How to save and prepare sheep skins for market." One member stated that he had learnt something from the article; he had only recently started keeping sheep, and found that the skins from the animals he had killed were riddled by weevils. It was suggested that to obviate the necessity for keeping skins for any length of time arrangements could be made with the Farmers' Union to take delivery of small parcels of skins, and pack several lots together to send to market. as freight and other charges would be saved.

Onetree Hill, April 18.

Present—Messrs. Bowman (chair), F. Bowman, J. Flower, J. Hutchens, F. L. Ifould, A. Thomas, and J. Clucas (Hon. Sec.).

BLINDNESS IN SHEEP.—This trouble was reported to be prevalent. Alum water was recommended. For what is known locally as cancer in the ears of sheep, it was recommended to cut the ear off as soon as the trouble is noticed.

SEEDING AND CULTIVATION OF SOIL.—Mr. Hutchens initiated a discussion on this subject. In seeding it was not wise to drill in seed without manure; it would be better to broad-cast the seed. With our scanty rainfall it was difficult to decide between light and shallow ploughing; much depended upon locality and nature of the soil; the same applied to the question of breaking the subsoil without bringing it to the surface. Climatic conditions also prescribe a limit to the quantity of manure that can be profitably used; in the hills as much as 3cwt. to the acre may safely be applied, as witness the unusually heavy crops often seen on the headlands. A member had dressed portions of his crop with 1cwt. and 2cwt. manure respectively, and the heavier dressing gave the most profitable result. New land did not require so much manure as land cropped for some time. Stable manure properly applied was very useful, but the bulk of matter to handle and cost of distribution was against it. One or two members expressed the opinion that ere long the application of commercial fertilisers to pasture land would be general. One

member intends to experiment in this direction during the coming season. To avoid bother with manure refusing to run freely, mixing of sand and pulverised sheep manure with it was recommended, care being taken to mix in regular proportions and to get a thorough mixture. A sieve was very useful in mixing. One part of sand to three parts manure was stated to have the desired effect in drying sticky manures.

Port Germein, April 19.

Present—Messrs. G. Stone (chair), W. Head, W. Holman, H. Kingcome, J. R. Gluyas, W. Mortess, T. Smith, E. G. Blessing, D. Thomson, J. K. Deer, C. O'Loughlin, P. Hillam, and G. F. Steinthal.

HON. SECRETARY.—Mr. A. H. Thomas tendered his resignation as Secretary, and was accorded a vote of thanks for his services. Mr. G. F. Steinthal was appointed Hon. Secretary.

IMPROVEMENT OF BUREAU.—Considerable discussion took place on this question, and it was resolved "That this Branch is in sympathy with Mr. Grasby's proposition in reference to the constitution of the Central Bureau, and in favor of increasing the number of members of Branches; also that the various expert officers attached to the department should visit the outside Branches oftener, to give the members and residents the benefit of their knowledge." Mr. Kingcome thought the members of the various Branches were altogether too dilatory, and, unless as individuals they bestirred themselves a little more, they must not be surprised if the Government felt disposed to give less financial assistance. Mr. Mortess deprecated any considerable expenditure on the proposed lecture courses by experts. If the members would read the various agricultural periodicals and make notes of matters of special interest, the members generally would profit thereby. This view was held by most of the members. [Very good advice.—GEN. SEC.]

MIXED FARMING.—Mr. Kingcome read a paper on "Will it pay to keep sheep? Will it pay to keep cows? Will it pay to grow wheat? Or, will it pay to combine all three?" The contention of the writer was that, for making farming successful, it was necessary to combine wheat-growing, dairying, sheep-farming, and poultry-keeping, with which members were generally in accord.

Paskeville, April 19.

Present—Messrs. A. Goodall (chair), A. C. Wehr, J. P. Pontifex, H. F. Koch, T. H. Price, A. Palm, R. Hamilton, G. Meier, J. G. Price, and W. S. O'Grady (Hon. Sec.).

STICKY FERTILISERS.—In discussing the difficulty in getting some damp kinds of manures through drills it was mentioned a mixture of a small quantity of shell sand from the sea shore minimised the trouble. Mr. Wehr had found that a little grease applied to the clogging parts before starting prevented the manure sticking so much and greatly facilitated the cleaning. The Hon. Secretary had found a mixture of kerosene and oil very good, and others preferred pure kerosene.

IMPROVEMENT OF POULTRY.—This Branch has decided to try to improve the poultry in the district, and will procure suitable fowls for the purpose. There was considerable discussion with regard to which are the best fowls for laying, or for table purposes, or for crossing with a view to securing desired results. [The trouble is that poultry experts give such a variety of "utility"

breeds and crosses, without a distinct opinion as to which is to be selected before all others, that the average farmer cannot make up his mind on the subject. I hold on to the Dorking for all-round purposes, the Indian-Game rooster and Dorking hen progeny (first cross) for table use, and Minorca or Leghorn for eggs.—GEN. SEC.]

Watervale, March 24.

Present—Messrs. C. A. Sobels (chair), S. Solly, H. Beck, J. Thomas, C. H. Castine, G. Hunter, H. Scovell, E. W. Castine, and E. Treloar (Hon. Sec.).

PROFIT IN APPLES.—Mr. Hunter said he owns a Cleopatra apple tree from which he has gathered 3bush. each year for three years, and 11bush. this season. Other members stated that Rome Beauty apples were very small this season, and that the trees should be planted in moist places. Prices have been good this season, but crops short and small fruit.

BRANCH SHOW.—The Annual Branch Show was very satisfactory.

RUST ON GRASS.—Some members consider that the presence of some kind of rust on grass has been the cause of poverty of cattle this season.

Finniss, April 7.

Present—Messrs. J. Chibnall (chair), S. Eagle, H. Langrehr, W. W. Heath, S. Collett (Hon. Sec.), and one visitor.

CODLIN MOTH.—Discussion took place on the regulations dealing with the codlin moth, members being of opinion that they were too strict.

Wandearah, April 21.

Present—Messrs. Geo. Robertson (chair), W. Roberts, A. W. Davidson, E. H. Eagle, W. J. Fuller, J. Wall, C. E. Birks (Hon. Sec.), and one visitor.

MANURES FOR CEREALS.—Discussion took place on quantity of manure per acre to apply, the majority favoring 45lbs. super. One member stated that since using manures he had nearly double as much feed on the land, and it was of better quality. His cattle did not now suffer from stiffness in the legs, as they used to do sometimes.

STOCK COMPLAINTS.—Several members reported having lost cows from impaction. In some cases treatment had been tried without success.

FEEDING STOCK.—Different methods of feeding cows were discussed; some members favored feeding from the nosebag, others in manger. The necessity for supplying bonemeal, sulphate of iron, and salt to keep them in health was unanimously admitted. It was thought that in feeding crushed wheat to horses great care was necessary, as there was a danger of it affecting the wind.

Mallala, April 21.

Present—Messrs. F. M. Worden (chair), J. McCabe, A. Moody, G. Marshman, J. Nairn, H. B. Moody, J. Nevin, M. H. East, W. R. Stephenson (Hon. Sec.), and one visitor.

COST OF WHEAT-GROWING.—Mr. Nairn read a paper on this subject to the following effect:—

In estimating cost of wheat-growing many different things must be taken into consideration, and it is difficult to arrive at a fair general estimate of the cost. The man farming on a small

scale cannot work so cheaply as one putting in a large area. There is no advantage in a man with 200 to 300 acres having more than five or six horses, as these will be idle more than half their time; while the man with 1,000 acres or more can do all his work with eight horses, and implements correspondingly larger. The man on the small place has nearly as much money invested in machinery, and only has half the work to do. Then, of course, some classes of soil are much more cheaply worked than others. In the following estimate he had based his calculations on the contract price for such work, and allowed 56lbs. of manure per acre, estimating the crop at 10bush.; and a team of six horses, and implements in proportion, is required; the land to be all fallowed.

<i>Cost of Wheat-growing.</i>		£	s.	d.	
Ploughing		0	3	6	per acre
Harrowing		0	0	6	"
Scarifying, two at 2s.		0	4	0	"
Drilling in seed and manure		0	2	6	"
Manure		0	2	6	"
Seed		0	2	6	"
Stripping		0	2	6	"
Cleaning		0	1	3	"
Bags		0	1	0	"
Two years' rent		0	6	0	"
Rates and land tax		0	0	2	"
		£1	6	5	"

This makes the cost equal to 2s. 7½d. per bushel of wheat. By putting on 5s. worth of manure instead of 2s. 6d. worth, there is little doubt that 2bush. or more per acre could be added to the yield per acre, bringing the cost per acre to £1 8s. 11d. and the return to £1 10s.

Mr. H. B. Moody considered contract prices for the work the only safe basis of estimate. In his opinion Mr. Nairn's estimates of cost were, if anything, low. Mr. East thought that various set-offs should have been allowed, and that a man with 600 acres, fallowing 300 each year, could produce wheat at less cost than shown. Mr. A. Moody disagreed with cost allowed for ploughing. A man with a team of six horses could not average six acres per day. Mr. McCabe thought estimate fairly accurate. To fallow 200 acres with six horses was, however, a big undertaking. The Hon. Secretary said he had kept account connected with the working of a sixty-acre paddock, and considered Mr. Nairn's estimate not far out.

Orroroo, April 18.

Present—Messrs. W. S. Lillecrapp (chair), J. Moody, J. Scriven, E. Copley, J. Jamieson, M. Oppermann, W. Robertson, R. Coulter, jun., and T. H. P. Tapscott (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary's annual report showed that during the year eight meetings had been held, with an average attendance of eight members. Two papers had been read, and some very interesting discussions had taken place. Mr. J. Scriven was elected Chairman and Mr. Tapscott re-elected Hon. Secretary for ensuing year, a vote of thanks being accorded to officers for their past services.

DAIRYING.—The Hon. Secretary said that had it not been for the dairying industry the district would have been in a much worse state than it was, and he strongly believed the industry should be more largely taken up by farmers.

POULTRY.—Mr. Scriven read a paper on "Management of Poultry on the Farm," to the following effect:—

In this dry district I find that wheat-growing must be supplemented with something else to make even a living, and fowl-keeping has been carried on rather extensively on some farms to meet this contingency. Keepers of fowls meet with difficulties, so that it is not one continuous stream of success. Disease in various forms attacks the fowls, and my experience in the past has been that I have frequently picked up half a dozen dead fowls in a day, and

carried them away to be buried, feeling that so much food and labor had been wasted. Misfortunes like these make one work to find some remedy. I have noticed that as soon as the rains come and bring up the grass the fowls recover and mostly go on all right till the next year. This seems to teach that to a great extent the remedy lies in green feed. This we cannot always procure, but a substitute is green chaffed hay. The greenest sheaves are cut fine and put into a bucket and boiling water poured on, sufficient to soak it thoroughly; then let stand for a little time, so that it recovers to a great extent the original sap. If a little bran or pollard be added to this the fowls eat it readily and it keeps them healthy. Another very good plan is to soak the wheat for a day or two and feed it to the fowls in a soft condition. Another difficulty that meets the fowl-keeper is tick, a pest that has carried off thousands of fowls. I am not sure that it can be entirely exterminated, but it can be kept in check so that it need not be very harmful. I have been successful in this way—I destroyed the old fowl house by throwing off the straw roof and taking all the wood to the house wood-heap and chop it up and use it for firewood; when the wood is removed burn all that is left and remove the fowls to a fresh place some distance off. The new fowl house should not have any of the old material, but everything new and the wood as free from cracks as possible. Of course iron houses are the best, as suggested by the *Journal*, but I am speaking of a means that is in reach of all. Mallee forks and straw roof with mallee roosts (deal is much better, but costs money) hung with wire so that ends of the roosts do not touch any portion of the walls, and if the wire is fairly fine, say number 10 or 12, it is not a very good road for the tick to travel, and will help very materially to keep them away from the fowls at night. The fowl house should be cleaned frequently and insecticide and kerosene used freely on the wood-work. Another help in checking this pest is to cart away each year the straw roof and thoroughly sweep up and cart away every bit of rubbish about the fowl run and burn it, and then cart back clean straw, which can be done after harvest when the straw-carting is on. I have found that straw walls are very comfortable for the fowls, and one can make capital nests for the hens to lay in these walls; hens are very fond of clean straw in which to lay their eggs. There should be a separate compartment made crow-proof for the hens to lay in, as the crows are a great nuisance and carry away a lot of eggs. That is easily managed with wire netting, but should be close on at least two sides, as the hens seem more comfortable if partly hid. Nature seems to teach them to lay in a place of cover, and we can do no better than follow nature. Last but not least, the fowls must have plenty of food and water. The water should be shaded in hot weather. By following the plan indicated here I am sure that the farmer will get more profit out of his fowls than if they are left to take care of themselves.

IMPROVEMENT OF BUREAU MEETINGS.—Mr. Coulter read a paper on this subject as follows:—

How to advance the interest of the Bureau has been discussed by larger gatherings than represented in a Branch meeting, but without very much success. The success of the Branch meetings generally would mean success to the whole of the institution, and the success of the Bureau depends on its members and not on special circumstances that may arise. It is true that something special frequently does present itself for discussion, but the matter that is required to make the whole concern a public benefit is matter to be sought for. Members who quietly wait for "something to turn up" are of very little use to the institution, and I should say that in a State like ours, with its varied industries, climates, conditions, and circumstances, there is ample room for observation and investigation; and while new appliances or methods should not be disregarded or untought for, their absence should by no means cause stagnation. If every member recognised that it was his business when he left one meeting not to forget all about the interests of the Bureau until he came to the next, but to a reasonable extent use his powers of observation and thought, endeavoring to find something new, or to establish or disprove something old, or gather some information that he might deem to be of use, one meeting a month would not be sufficient to deal with the matter submitted. Each member doing this the interest would be sustained and benefit derived. There are practical subjects that touch our every-day operations, and theoretical subjects that by discussion and attention might be brought within the range of the practical, within our reach, and, while there, if our meetings fail the fault is ours. Accepting this, next in importance is the attendance of members. Any person accepting the position of member places himself under obligation to attend a reasonable number of meetings. In recognition of his membership he receives free the *Journal*, and the Branch has, to limited extent, its expenses paid, so that he stands in a sense between the Government and the public as a medium to gather and dispense information. Further, every member should be willing and ready to place at the disposal of his Branch any and all the information he may possess; indeed, any member not willing to do this is not honest. Then again there should be method in conducting the meetings—as near as possible a time for everything. I must say that sometimes our meetings degenerate into nothing but gossip; not unfrequently I have known every member to be talking at once. Only two things are recognised as having a fixed place—the minutes and correspondence. If anyone desires to ask a question he has to

jam it in at the first opportunity, and sometimes that opportunity is very inopportune, drawing the attention from a subject then under discussion. I would suggest the following as the order of the meetings:—(1) Minutes; (2) correspondence; (3) questions, the time to be limited; (4) adjourned debates; (5) new subjects; (6) notice of subjects, such to be approved by the meeting. Every member when asking a question, or reading a paper, or submitting a motion for discussion, or speaking to any paper or motion, to stand; and I think every member should be expected to contribute something once a year. If any member feels that he cannot write his opinions there is less difficulty in submitting a short motion, and upon that motion open a discussion. I firmly believe that if the foregoing suggestions were observed our institution would be a success.

Scale's Bay, April 19.

Present—Messrs. J. J. Roberts (chair), A. Newbold, Geo. Newbold, R. S. Thomas, and D. P. Thomas (Hon. Sec.).

RABBITS.—Although large numbers of rabbits have been and are being destroyed by strychnine, arsenic, and phosphorus, there are still a great many left. There has been a proposal to use poisoned water at night, and covering it early in the morning to avoid poisoning birds.

“WILL WHEAT-GROWING PAY?”—Mr. A. Newbold read a paper to the following effect:—

To decide this question we must ascertain at what cost per bushel wheat can be grown and conveyed to market. Supposing wheat to sell at 3s. per bushel at Port Adelaide, we have to deduct 9d. from that to pay for cartage, ship freight, wharfage, and other expenses, which leaves the grower 2s. 3d. to pay for cost of production and all other expenses. Suppose he crops 400 acres, and gets an average of 6bush., it would come out something like this:—

Dr.		£
300bush. seed at 3s.	.....	45
Cleaning 600 bags wheat at 6d.	.....	15
Labor and provisions	.....	100
Blacksmith and saddler	.....	10
Freight on goods from Port Adelaide	.....	10
Wire netting instalments	.....	12
Taxes and rates	.....	15
Rent	.....	12
Destruction of rabbits	.....	20
Corn sacks	.....	12
		<u>£261</u>
Cr.		£
2,400bush. wheat at 2s. 3d.	.....	270
Less expenditure	.....	251
		<u>£19</u>

That allows nothing for interest on capital, or allowance for depreciation in machinery, &c., rusting out of wire netting, oil, paint, and no end of other things that must be renewed. The conclusion appeared to be that in nearly all parts of the State wheat-growing will have to be abandoned within twenty years, unless a considerable rise should occur in the price of that commodity.

Members pointed out that the West Coast is one of the poorest and most isolated parts of the State, but even here the use of manures and improved implements would make a great difference.

Naracoorte, April 12.

Present—Messrs. S. Schinckel (chair), E. Thomas, W. H. Terry, Job Wynes, J. B. Bennett, G. Wardle, and A. Johnstone (Hon. Sec.).

CONFERENCES.—Members were unanimously opposed to division of South-East district for the purpose of holding Annual Conferences in two portions

each year, viz., Millicent, Mount Gambier, and Penola as one district, and Kingston, Lucindale, Naracoorte, and Tatiara as the other.

MILLICENT CONFERENCE.—Messrs. Schinckel, Johnstone, and Wynes reported upon their attendance at the Millicent Conference of South-Eastern Branches, with which they were much pleased. On the way to Millicent and back they visited several farms and gardens, including those of Mr. W. Foster and the Coonawarra Fruit Colony. At the winery there they learned that 53,000 galls. of wine were produced in 1901, and it was expected that 70,000 to 80,000 galls. would be produced next year. There were 24 tons of grapes coming in daily, and the prices paid were £6 per ton for Cabernet and £4 10s. for Shiraz. At Mr. Foster's garden, Rendelsham, all sorts of flowers and trees seem to grow in the greatest luxuriance and with little trouble. Apples were rather too large to keep for long; chicory roots ran to 2ft. in length. A vote of thanks to the Millicent Branch for hospitalities was accorded.

HON. SECRETARY.—The Hon. Secretary resigned for a time on account of proposed visit to England, and Mr. Terry accepted the position till end of year.

WATTLES.—In answer to Mr. Terry it was stated that *Acacia decurrens* (or black wattle) is best suited for cultivation in the South-East, and does well on a black sandy soil upon clay subsoil.

OYSTER SHELLS AND IMPACTION.—Mr. Wardle said Mr. Burke had successfully used one dessertspoonful of ground oyster shells as a cure for impaction in cattle.

BOTFLY.—In discussing Mr. Peake's paper on botfly Messrs. O. Hunt (an old member who has just revisited the district), Schinckel, and Wynes did not agree with the author. They had no doubt that the bots were injurious to the stomach of the horse, and if not prevented the horse would die. The Chairman had tried the remedies advocated at the Bureau meetings and had since had no trouble with bots in his horses. The bots had all vanished. He rubbed the horse with an oil rag on all parts where the nits can be reached by the horse's mouth. Mr. Hunt was surprised at the statements made by the "vets." quoted by Mr. Peake, which were opposed to opinions expressed by other "vets." The general opinion in North-West Wimmera is that the bots are injurious to the horse. The Chairman said that Inspector Williams told him he knew of two horses in the South-East that died from the complaint, and Mr. Schinckel's brother had told him that some horses over the Border had died through bots.

BEST WHEATS FOR DISTRICT.—Chairman recommends Dart's Imperial, Tuscan, Marshall's No. 3, and Steinwedel as good wheats for this locality.

Port Elliot, April 19.

Present—Messrs. J. M. McLeod (chair), W. E. Hargreaves, F. Basham, O. B. Hutchinson, A. Grey, A. Pannel, E. Hill, C. Gosden, H. Green, R. E. Ullrich, and J. Brown (Hon. Sec.).

RUBBER TREES.—Mr. Hill read an interesting account of the various rubber-producing trees and the methods adopted in gathering the rubber.

SHOW AND CONFERENCE.—Messrs. McLeod and Hargreaves reported on show of produce held in connection with Mount Compass Branch, and it was suggested that a similar show be held at Port Elliot next autumn. Regret was expressed at the abandonment of Annual Conference at Strathalbyn owing to lack of interest shown by Branches. Members consider these annual gatherings of great value, and it was decided to discuss at next meeting the advisableness of arranging for a Conference at Port Elliot.

Port Broughton, April 21.

Present—Messrs. W. R. Whittaker (chair), Jas. Bates, B. Excell, A. E. Button, E. Dennis, A. H. Dolling, J. Harford, and J. Barclay (Hon. Sec.).

PICKLING SEED WHEAT.—Discussion took place on best way to pickle seed wheat. Immersing or dipping the seed was favored, as the light seed and bunt balls could be skimmed off; 6ozs. to 8ozs. of bluestone to the bag of wheat according to condition of seed is sufficient.

QUESTION MEETING.—It was decided that at next meeting each member bring forward at least one question.

Angaston, April 19.

Present—Messrs. F. Thorne (chair), S. O. Smith, A. Sibley, A. Friend, J. Vaughan, R. Player, W. Sibley, J. H. Snell, F. Salter, E. S. Matthews (Hon. Sec.), and eight visitors.

ANNUAL REPORT.—The Hon. Secretary's report showed that twelve ordinary meetings and one special had been held during the year, the average attendance being nine. Ten papers had been read and discussed, various wheats experimented with and reported on. The rule *re* non-attendance had been strictly enforced. The *Journal of Agriculture* is greatly appreciated by the members, and the advice given therein is often acted on. The Vine, Fruit, and Vegetable Protection Act has been loyally supported by the Branch. Mr. W. Sibley was elected Chairman and Mr. E. S. Matthews re-elected Hon. Secretary for ensuing year.

CODLIN MOTH.—Members thoroughly discussed this question, Mr. P. Trimmer, the local fruit inspector, being present by invitation. This Branch favors the enforcement of Vine, Fruit, and Vegetable Protection Act, and indorses the action taken by the inspectors, regretting at the same time that better treatment is not meted out to them by the growers. Members are of opinion that the inspector should be treated more as a friend and a little less as an enemy, especially by growers who should know better. Members feel that in order to do the work properly more inspectors are required, as the present inspectors are expected to look after too large districts. It was decided to ask the Central Bureau to take action to prevent the railways carrying "returned empties" without any inspection or certificate of cleanliness. This question of empties is regarded as most important, as it is a most serious source of infection. Experimental spraying is advocated, but State aid for same is not desirable; the picking of all fruit for a season is advocated, it being suggested that action in this direction be taken in one district at a time, the growers in other districts paying compensation for the fruit so destroyed. All growers are urged to refrain from putting obstacles in the way of inspection, and also to faithfully undertake their share of the work of ridding growers of the serious pest.

Wilmington, April 20.

Present—Messrs. W. Slee (chair), T. Carter, R. Cole, A. Maslin, J. McLeod, F. Bauer, M. Bischoff, J. Lauterbach, and R. G. S. Payne (Hon. Sec.).

MANURING FRUIT TREES.—Discussion took place on use of super. for fruit trees showing signs of deterioration. The Hon. Secretary explained method successfully adopted in other parts in manuring fruit trees suffering from lack of plant food. The Chairman intended to try the effect of manure on a few orange trees. Two very fine pomegranates from three-year-old trees were shown by the Chairman.

Redhill, April 22.

Present—Messrs. D. Lithgow (chair), S. H. Treloar, R. T. Nicholls, R. H. Siviour, A. E. Ladyman, T. Wheaton, H. Darwin, D. Steele, A. A. Robertson, J. N. Lithgow (Hon. Sec.), and two visitors.

PREPARATION OF SOIL.—Mr. Treloar initiated a discussion on this subject. The three main objects of soil cultivation for wheat were—(1) to conserve the moisture; (2) to clean the land of weeds; and (3) to prepare a good seed bed. To obtain the desired end fallow early while the ground is quite moist, and work it thoroughly to a depth of 3in. or 4in. Where the land is likely to drift do not work it down too fine. To destroy weeds cultivate the surface when necessary. In this district dressings of 150lbs. or over of super. are not profitable. In the discussion which followed it was agreed that it paid to do some fallowing in summer where it was possible, as it enabled the farmer to finish earlier and to work the fallow before the dry spring weather sets in. Ploughs cutting a narrow furrow could be used with advantage, as they bring the land to a better tilth, and are of lighter draught. If rain could be depended upon in the early part of seed time it would pay better not to fallow the red sand and clay soils in this district.

Morgan, April 19.

Present—Messrs. R. Windebank (chair), F. G. Wohling, J. Pope, H. Wohling, G. Wittwer, and W. G. F. Plummer (Hon. Sec.).

MARKETING OF EGGS.—Discussion took place on this subject with the result that each member present decided to endeavor to send a consignment to Adelaide on his own account.

DAIRYING.—Discussion on qualities of different breeds of cows took place, and it was mentioned that the Alderney (Jersey) was said to be too delicate for dry country. Mr. H. Wohling said he had had a very pure-bred bull of this breed on his farm right through the past dry seasons, and could see no difference in his hardness compared with the other breeds he was running with.

OFFICERS.—Mr. Windebank was re-elected Chairman, and Mr. W. G. Plummer elected Hon. Secretary, the retiring officers being thanked for their services.

Nantawarra, April 23.

Present—Messrs. J. Nicholls (chair), T. Dixon, jun., G. Belling, S. Sleep, R. Uppill, A. L. Greenshields, H. J. Spencer (Hon. Sec.), and two visitors.

STANDARD SAMPLE OF WHEAT.—Letter was received from Corn Trade Section of Chamber of Commerce on this subject, pointing out that the desire of the Committee was to fix a fair trading sample that would command full value, and that anything under that standard must be sold at special rates.

HORSE-BREEDING.—Mr. G. Belling initiated a discussion on this subject. Good horses were necessary on the farm, and it will pay the farmer to breed them. For draughts he preferred the Clydesdale, the heavier the better, combining action with weight. If such a horse got too slow for farm work at 10 to 12 years old he would command a good price for dray work. Farmers often patronised a third-rate stallion because the service fee was lower than that for a good animal, but this was false economy. A good animal will cost no more to keep, and if sold will fetch a good price. Farmers in a district should combine to secure the services of a first-class draught horse. In Germany the Government had done a great deal to improve the horse stock by providing good stallions for use of landowners in somewhat similar way to

what the department had done here in regard to bulls. For breeding purposes mares of good temper, good shape, and good doers should be selected. For both mother and foal a plentiful supply of good natural herbage was necessary. When this is deficient the foals at weaning must have some good feed provided to assist in the development of bone and muscle. Mr. Green-shields thought a heavy-bodied horse with lighter legs would be better on the farm than very heavy horses. Mr. Sleep considered the heavy horses too slow; he believed in rearing horses on the farm. Mr. Dixon agreed generally with Mr. Belling; with young stock of every kind it was essential that they should not lack good food. A man must "feed well" besides "breeding well." The Chairman said it was generally agreed that the progeny took more after the sire in shape and after the dam in temperament. Members agreed that it was unwise to breed from a jib or vicious mare. In reply to question Mr. Belling said £2 5s. to £2 10s. was a fair price for service of a good stallion; a young horse 4 to 5 years old should be limited to forty to fifty mares, but if a less number were accepted it would be better for the breeders.

Balaklava, April 12.

Present—Messrs. P. Anderson (chair), C. L. Reuter, C. Reid, A. Manley, W. H. Thompson, W. Smith, A. W. Robinson, J. Vivian, E. Hams, W. Tiller, G. C. Neville, A. Hillebrand, and E. M. Sage (Hon. Sec.).

PRESENTATION TO MR. A. W. STEINWEDEL.—Arrangements were made for holding a public meeting for the purpose of presenting an illuminated address to Mr. A. W. Steinwedel, in recognition of his efforts to improve the varieties of wheat, and especially in connection with the variety to which the name "Steinwedel" has been given. [The subscription was limited to 4s. per Branch, and responses came from one end of the State to the other. The organiser of the movement was Mr. E. M. Sage and the members of the Balaklava Branch, and the presentation was made at the Balaklava Institute, on April 26, when a large number of members of adjacent Branches was present, together with several farmers who were desirous to show their appreciation of Mr. Steinwedel's worth. Mr. Steinwedel thanked the donors of the address in most feeling terms, and a vote of thanks to the Hon. Secretary and members of the Balaklava Branch closed the proceedings.—GEN. SEC.]

Tatiara, April 19.

Present—Messrs. W. E. Fisher (chair), P. Law, H. Killmier, D. Makin, T. Makin, T. Hall, and T. Stanton (Hon. Sec.).

CONFERENCES.—Members are in favor of dividing the South-East Branches into two sections for the purpose of holding Annual Conferences.

DRY FALLOWING.—In this district it will not matter if the land is fallowed up dry, provided the seed is not sown until after a good fall of rain has occurred.

DRILLING SEED.—Members consider that it is advantageous to drill in seed of cereals, even if fertilisers are not used at the same time, because the seed will be buried at an even depth and more regularly, so that a much better stand is secured than where seed is sown broadcast.

QUESTION MEETING.—Resolved to hold a meeting for answering questions. Mr. Hall will answer on horses and cattle, Mr. Killmier on agriculture, Mr. Fisher on gardening, Mr. Makin on sheep and wool, Mr. Smith on vines and orchards. All questions to be sent to the Hon. Secretary by May 10.

Strathalbyn, April 21.

Present—Messrs. M. Rankine (chair), D. Gooch, W. J. Tucker, W. M. Rankine, J. H. Mules, H. H. Butler, P. Cockburn, and J. Cheriton (Hon. Sec.).

CODLIN MOTH.—Circular from Hahndorf Committee requesting support towards an appeal for amendment of the Vine, Fruit, and Vegetable Protection Act was discussed at considerable length. It was resolved—(1) That if owners of old and gnarled trees find that they are difficult to clean they should be pruned heavily or cut back and grafted; (2) that the members of this Bureau are of opinion that the power given to instructors under the present Act are not too drastic if suitable men are appointed and the duties properly carried out; (3) that no infested fruit should be allowed to leave the owner's premises, but should either be destroyed or fed to pigs.

SEEDING.—Mr. G. J. Reed forwarded paper on this subject. In the southern districts dry ploughing appears to encourage the spread of takeall, besides causing dirty crops. If the land is left nine or ten days after a good rain most of the rubbish has germinated and ploughing is facilitated. He would follow the plough as closely as possible with the drill, as the latter implement will help to break up the soil and make a good seed bed, but if left until another rain the ground sets and the drill drags through and makes the land harder. Good seed only should be sown, and as much of it as possible should be early-maturing varieties. The late wheats should be put in first.

Caltowie, April 25.

Present—Messrs. J. Leahy (chair), J. T. Lehmann, C. Jettner, J. H. Both, G. Petatz, J. McCallum, A. Kerr, L. Graham, N. Hewett, F. Lehmann (Hon. Sec.), and two visitors.

DISEASE IN CATTLE.—Mr. Neate, a member, has recently lost twelve head of cattle, owing, he thinks, to impaction. Mr. Kerr had lost a lot of sheep, and had an idea that poison weeds were the cause. Mr. Hewett, has lost about a dozen cattle; they seemed quite well in the evening and were dead next morning. Other members detailed their losses. In many cases the feed was not deficient in the paddocks. It was mentioned that several farmers had given a little bonemeal and salt in the food of their cattle with beneficial effect. Where cattle are watered from dams or reservoirs there is apparently a deficiency of salt.

Inkerman, April 22.

Present—Messrs. W. Fraser (chair), F. C. Smart, R. Kennedy, J. Lomman, C. H. Daniel, W. W. Mugford, J. C. E. Daniel (Hon. Sec.), and two visitors.

PICKLING WHEAT.—Mr. F. C. Smart had for years pickled his seed wheat with $\frac{1}{2}$ lb. of bluestone per bag and still had trouble with bunt; but this trouble disappeared when he dissolved $\frac{1}{2}$ lb. of bluestone in a gallon of water, pickled his seed with it on the floor, and then sprinkled common salt over it. Mr. Mugford said he had often sown the headlands with unpickled wheat when there had not been enough pickled to finish up, and sometimes this had been half bunt whilst the pickled portion was quite free. It was resolved that pickling seed wheat with $\frac{1}{2}$ lb. of bluestone in 2galls. water is a preventive of bunt. It is best to pickle some time before sowing, and the seed should be fully ripe before reaping.

Holder, April 13.

Present—Messrs. J. Rossiter (chair), W. Wood, F. G. Rogers, E. Jaeschke, S. Pickering, F. Starr, J. J. Odgers (Hon. Sec.), and two visitors.

BUSINESS.—The member who had promised a paper not being present, discussion on several subjects referred to in April issue of *Journal* took place. Mr. Rogers stated that trays for drying apricots cost £3 per 100 for the timber. Medea wheat was considered by some members to be very suitable for this district; other members strongly favored Thomas' Rust-proof. Tree lucern was considered a good breakwind, and was especially valuable, as the young growths made good stock feed.

Boothby, April 25.

Present—Messrs. J. T. Whyte (chair), W. B. McEwen, J. A. Foulds, H. G. Robinson, T. Sims, R. Chaplin, J. Bell, E. Bradley, D. Sims, A. A. Turnbull (Hon. Sec.), and seven visitors

EXHIBITS.—By J. Bell, piece of teatree, 3in. x $\frac{3}{4}$ in., extracted from thigh of horse after it had been there twelve months. By J. A. Foulds, two very large pie melons, grown on fallow.

FORESTRY.—Mr. J. A. Foulds, in a short address, expressed his opinion that destruction of forests does not affect rainfall.

Narridy, April 26.

Present—Messrs. J. Darley (chair), J. Liddle, A. Rowe, D. Creedon, A. Bairstow, J. Smart, J. Nicholson, E. Smart, H. B. Turner, and Thos. Dunsford (Hon. Sec.).

PREVENTING BUNT.—The Hon. Secretary and the Chairman referred to the practical usefulness of the papers read and discussed at the Crystal Brook Conference. It had been satisfactorily proved that the use of pure bluestone in a proper manner is a preventive of bunt.

STANDARD OF F.A.Q. WHEAT.—Members are all agreed that there should be a permanent fixed grade or standard weight per bushel, and that it should be 62lbs. They desire that each Branch shall consider this matter at an early date.

Booleroo Centre, April 21.

Present—Messrs. W. H. Nottle (chair), J. Repper, N. Clack, D. T. Parsons, Dr. Steven, J. Murdoch, W. Brooks, T. McMartin (Hon. Sec.), and one visitor.

CATTLE ON THE FARM.—Mr. J. Repper in discussing the Hon. Secretary's paper read at last meeting, agreed that pure Jerseys are too delicate, but believed that the cross between Ayrshire and Jersey or Alderneys would be hardier. The Chairman did not think it profitable to breed cattle of any kind in this locality, either for beef or dairy. Mr. Murdoch believed Ayrshires are the best. He had an Ayrshire cow that gave 12lbs. butter per week. He crossed her with a Durham bull, but did not get any progeny as good as herself. Dr. Steven did not think the district suitable for dairying, and it was not worth while to keep cows for what could be made out of their produce.

Lyndoch, April 24.

Present—Messrs. H. Kennedy (chair), R. Ross, W. Burge, F. Warren, J. M. Thomas, W. Rushall, P. F. Zimmermann, A. Springbett, H. Springbett, W. J. Springbett, R. Loveridge, and J. Mitchell (Hon. Sec.).

PEACH-GROWING.—Mr. F. Warren read a paper on this subject to the following effect :—

First, a few of the blunders that a new chum at peach-growing, like I was when I started, is likely to make. If I had done what I intended, after ploughing the land deeply, I would have dug large holes 2ft. to 3ft. deep and mixed manure with the subsoil; but I had a look at a garden planted the year before in this way, and that satisfied me that some other method was the right one. Digging deep holes in this way is simply making a number of wells, in which the water accumulates and the roots decay. From this and other lessons, when planting now I simply remove 6in. to 9in. of the surface soil after ploughing, break the subsoil—the hole being 3ft. to 4ft. in diameter—and the soil and subsoil worked up into a cone the height of the surface of the surrounding soil. Where each tree is to be, put in a stout stake in proper line, and have a supply of nice mellow soil handy. When you have done this, send for your trees, allowing only a reasonable time for the nurseryman to pack and send them to a specified train. Get the trees as soon as possible after they are dug, and plant at once. Work early and late planting, but if hot, not in the middle of the day. Take your tree, tie it to the stake, spread each root carefully and train it down the cone of soil previously referred to, then fill in the prepared soil, press against the roots, and finally fill up the hole. Treated in this way there should be very few losses. Out of 485 trees—300 being citrus trees—planted last season, I only lost three.

Another fruitful source of error is in pruning. My first mistake was to leave too many branches on the tree when planting, and it took me a long time to grasp the fact that it was a mistake. The second year after planting I was ignorant; the third, too grasping (I wanted something to show for my hard work); the fourth, well satisfied with myself, having vigorous trees that, although I did not recognise it, were running away from me. I summer pruned, or rather topped, the trees, but they grew all the stronger, and at six years old I required a ladder to pick the fruit from them. A little wind caused a rude awakening to the fact that I had been working on a bad system. I asked advice of a number of growers and each contradicted the other. The only resource was to reason out the matter and decide for myself who was right. The fruit was at the top of the tree. Why? Because the fruit-bearing wood was there, and in the centre of the tree the light could not penetrate. Then there was no room for fruit-wood lower down. Having formed my own opinion on what should be done, I start my young trees with three shoots, if possible; but if I cannot get them where I want them, I leave four, or even five, until I see which are the best, and then reduce to three. If the branches on the tree received from the nursery start higher than 18in. to 2ft. from the ground I cut the tree down to that height. During the summer suppress any shoots not wanted, and pinch back the main leaders to strengthen the main shoot. Next year leave two shoots on each of the three shoots of previous season's growth, and keep the six shoots going until you have room for twelve, when you can consider your tree formed. At three years the peach will usually start bearing, and the grower must look after the fruit-wood. The tree should be fairly shaped by then to allow cultivation close up to the stem. At this stage little winter pruning is necessary; in fact, by heading back I find that a great number of the buds I expect to bear fruit drop off. In winter I only thin out where I have left too much in the summer; the consequence is there is a tremendous setting of fruit. When the fruit is well set all the growths that can be spared are removed, and never more than three peaches are left on a twig. If a shoot has no fruit on it it is cut back to one bud, from which a good fruit-bearing shoot comes the following year. Never lose a chance to reduce the spurs; when they get far from the main stem I regard them as useless, but by cutting them back I have a regular supply of strong fresh growths coming away from close to the main stems and bearing fruit of good quality. By this method the trees are kept within bounds, are open in the centre (a very important matter), the fruit sets freely and is judiciously thinned, there is little loss from wind, the fruit is low down, easily gathered, and of good quality. From nineteen bearing trees treated in this way I have sold to one man 1,018 dozen, besides what were sold to others, and they were all of first-class quality. Now, this is my experience. It may or may not apply to other districts or soil. The individual grower must settle for himself whether it will suit his conditions, try it on a small scale, and, if successful, then he can apply the system generally.

Considerable discussion ensued, and a vote of thanks was accorded to Mr. Warren.

VINE-PRUNING.—It was decided to ask Professor Perkins to give a practical demonstration in pruning of vines in June, and a committee was appointed to make arrangements for demonstration.

Mylor, April 19.

Present—Messrs. W. J. Narroay (chair), E. W. Hayley, W. H. Hughes, J. Nicholls, J. Smith, W. G. Clough (Hon. Sec.), and three visitors.

CODLIN MOTH.—Members regard present Act as unworkable, powers given to inspectors are far too wide; and infested fruit should be saleable if declared as such.

Benmark, April 24.

Present—Messrs. E. Taylor (chair), W. H. Waters, R. Nuthall, C. Millar, F. S. Wyllie, and F. Cole (Hon. Sec.).

CULTIVATION UNDER IRRIGATION.—The Hon. Secretary read a paper to the following effect:—

An orchard may produce crops for a time without pruning, manuring, &c., but unless the soil is cultivated the result is unprofitable. By "cultivation" is meant a thorough tillage to a depth of at least 4in., whilst 6in. is better still. Less than 4in. is labor thrown away. Cultivation is absolutely required to aerate the soil and to conserve moisture—and incidentally to destroy weeds. Excessive irrigation leaches the soluble salts to positions beyond reach by the roots of the plants. Most sandy and light soils would do best with half the usual irrigation, but with more cultivation. Excessive irrigation impoverishes the soil, brings up the injurious alkaline salts from the lower strata to the surface, and causes the roots of the trees to accumulate at the surface, thus reducing the food-supplying capacity, and involving frequent manuring, and making the trees more susceptible to climatic influences. Professor Hilgard's experiments and observations at the University of California conclusively proved this. When the roots are induced to come and remain at the surface, it becomes necessary to feed these roots abundantly both with moisture and with plant food. Had deep rooting been encouraged at first—instead of over-stimulation by surface fertilisation and frequent irrigation—some delay in bearing would have been amply compensated by less current outlay for fertilisers, and less liability to injury from delays and inadequacy of irrigation. To establish deep rooting the land should be broken as deeply as the plough can go, and every second year the subsoiler should be run over the land. The best time for the subsoilings is in early spring; this will break up the "hard pan," and permit the roots to go deeply. It is a mistake to broadcast super-, bonedust, and other fertilisers on the surface, as this brings the roots up. The manures should be buried as deeply as possible, so as to keep the roots deeply down. In irrigating it will be found that what would be an insufficient quantity on one kind of soil would be excessive on another kind. The irrigator must find out how much the soil will hold in suspension, and stop supplies before the water begins to leach away, carrying with it the dissolved plant food. The irrigating furrow should be drawn out as deeply as possible, so as to place the water where it will be of most benefit to the trees. This is most necessary in sandy soils. Some of the stiffer soils require flooding to give them sufficient water for the needs of the trees. The irrigator should know how long it takes water to penetrate a soil to a certain depth. Often the top soil is wet 6in. or 8in. and the under layers are quite dry; but the moisture ought to penetrate to a depth of several feet. In some stiff soils the penetration will be only 10in. or 12in. after two days, whilst in other soils it will penetrate over 2ft. in the same time. This shows the necessity for careful examinations to prove the depth to which the water penetrates within a certain time, so that the orchardist may regulate his irrigation accordingly. The latter portion of summer is often very trying to trees through the heavy evaporation from the soil and transpiration of moisture from the foliage. Very much of this loss can be prevented by proper attention to the surface conditions of the soil. Winter irrigation to a considerable depth is an effective method of promoting deep rooting, and will thus stand instead of later irrigations; which, being usually more scanty, tend to keep the roots at the surface.

The Chairman agreed that winter irrigation is much needed at Renmark to ensure good crops, as the rainfall is not sufficient to properly reach the subsoil. Many instances were cited to show that broadcast fertilising on the surface, insufficient irrigation, and excessive watering had injured orchards.

INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

Number of Persons Registered and Found Employment by Government Departments and Private Employers from March 23 to April 28, 1902.

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youths	123	94	216
Masons and bricklayers	2	1	1
Plasterers	—	—	3
Carpenters	10	1	17
Painters	3	—	—
Fitters and turners	4	1	—
Enginedriver and fireman	1	1	—
Boilermakers and assistants	6	1	6
Blacksmiths and strikers	7	—	5
Iron moulders	1	2	—
Plumber and ironworker	4	1	4
Compositors	3	—	—
Diver	—	—	1
Master mariner	—	—	1
Bootmaker	1	—	—
Apprentices	20	1	2
Cleaners	6	1	—
Porters and junior porters	10	2	4
Rivet boys	4	—	2
Miscellaneous	4	—	—
Totals	209	106	262

April 29, 1902.

A. RICHARDSON, Bureau Clerk.

The New South Wales Industrial Arbitration Act of 1901.

BY G. C. ADDISON, REGISTRAR UNDER THE ACT.

Objects of Act.

The New South Wales Industrial Arbitration Act, 1901, a measure framed by the Honorable B. R. Wise, K.C., M.L.C., Attorney-General, in order that practical effect might be given to the principles advocated by him for many years, was introduced by the Government in the Legislative Assembly on the 8th of August, 1901. On the 26th September the Bill passed the Assembly and was forwarded to the Legislative Council, through which body it was conducted by Mr. Wise. It received the Governor's assent, and thus became law on the 10th December last.

As its title shows, it is "An Act to provide for the registration and incorporation of industrial unions, and the making and enforcing of industrial agreements; to constitute a court of arbitration for the hearing and determination

of industrial disputes, and matters referred to it; to define the jurisdiction, powers, and procedure of such court; to provide for the enforcement of its awards and orders; and for purposes consequent on or incidental to those objects."

Comparison with New Zealand Statute.

An Act, having similar objects, has been in force in New Zealand during the past few years, but the New South Wales Act, besides being cast in a more concise form, differs materially from the New Zealand Act in three respects. In the first place, the local Act prohibits locks-out and strikes, at least until a reasonable time has elapsed for reference to the Court of Arbitration of the matter which is in dispute between employers and employés, and punishes persons causing or instigating locks-out or strikes by heavy fine or by imprisonment.

In the next place the neglect of employers or employés to form industrial unions under the Act will not prevent any industrial dispute being referred to the court, because the Registrar, who, under the court, is the chief administrative officer of the Act, is given power—(1) To inform the court of any breach of the Act; (2) to refer to the court an industrial dispute when the parties thereto, or some or one of them are, or is not, an industrial union.

In the third place the New South Wales Act contains a totally new provision, by which the terms of an award or order of the court may, by the court, be extended to cover or include all branches of the trade engaged in the same industry, the Act providing in terms that in any proceeding before it the court may do all or any of the following things with the view to the enforcement of its awards, order, or direction :—(1) Declare that any practice, regulation, rule, custom, term of agreement, condition of employment, or dealing whatsoever in relation to an industrial matter shall be a common rule of an industry affected by the proceeding; (2) direct within what limits of area and subject to what condition and exceptions such common rule shall be binding upon persons engaged in the said industry, whether as employer or as an employé, and whether members of an industrial union or not; (3) fix penalties for any breach or non-observance of such common rule, so declared as aforesaid, and specify to whom the same shall be paid.

This power to apply a common rule to all persons engaged in the same business or trade is intended to avoid the necessity of multiplying parties to a cause, while at the same time preserving the right to any party affected by the rule to bring evidence before the court to show reasons why he should be exempted from its operation.

Persons Affected by Act.

The two classes of persons directly affected by the Act are employers and employés. An "employer" means "person, firm, company, or corporation employing persons working in any industry, and includes the Railway Commissioners of New South Wales, the Sydney Harbor Trust Commissioners, the Metropolitan Board of Water Supply and Sewerage, and the Hunter River and District Board of Water Supply and Sewerage." An "employé" means "person employed in any industry." An "industry" means "business, trade, manufacture, calling, or employment in which persons of either sex are employed for hire or reward, but does not include employment in domestic service."

Registration of Industrial Unions.

In order that the full benefits of the Act may be obtained by either of the classes of persons above referred to, provision is made for the incorporation of bodies of employers or employés as industrial unions. In the first place, any person or association of persons, or any incorporated company or association of

incorporated companies, or of incorporated companies and persons, which has on a monthly average, during the six months next preceding the date of application for registration, employed not less than fifty employes, is eligible for registration. It must, however, be noticed that although provision is, as above mentioned, made for the registration of an individual employer as an industrial union, a discretion is given to the Registrar to refuse any application to register an industrial union if an industrial union to which the applicants might conveniently belong has already been registered. The object of this proviso is to restrain the multiplication of industrial unions and to promote collective bargaining, that is, bargaining between associations of employers and employes. The spirit and aim of the Bill is to draw together in industrial unions persons whose industrial interests are the same.

Employes can effect registration only if they are banded in trade unions registered under the "Trade Union Act of 1881," or if they are a branch of a trade union which is registered or has its head office outside the State.

The registration both of employers and employes may be effected in a simple way, the application being signed, in the case of companies, associations, or trade unions, by the majority of the directorate or committee of management, respectively. In order, however, to ensure the sound government of the unions, the statute provides that the rules or articles of the company, association, or trade union cannot be registered unless they contain provisions for the satisfactory conduct of its business affairs, and the proper control of its funds. The rules must, in short, deal with the matters set out in Schedule I. to the Act. At the time of writing, the registration of associations of employers and of trade unions is proceeding, and will probably be almost completed by the middle of the month.

Sketch of Procedure for Trade Unions.

A sketch of the procedure to be observed by trade unions in effecting registration has, under direction of the Attorney-General, been drawn up and issued by the Registrar. The contents of this sketch are as follows:—

Preliminary Procedure.

When a trade union decides to register, the secretary or other authorised officer should lodge in person with the Registrar (or, if inconvenient to attend in person, should send to the Registrar) a copy of the rules of the union.

The Registrar will then examine the rules, and will inform the secretary what additional rules (if any) are necessary.

Alteration of Rules.

All trade union rules must provide for matters mentioned in Schedule I. to the Industrial Arbitration Act.

Most union rules have the provisions as to management referred to in that schedule, but few (if any) unions have provisions in their rules as to the mode of making industrial agreements or as to registered officer, &c.

Model Rules.

The following "Model" rules will, therefore, be found useful to unions who wish to bring their rules into line with the schedule, but these model rules may be modified by a union if it is thought desirable:—

- (1) Industrial agreements and other instruments may be made by or on behalf of the union by the committee of management after such agreement or instrument has been approved of by a general or special meeting of the members of the union.

- (2) The union may be represented in any proceeding before the Industrial Arbitration Court by such person as the committee of management, with the approval of the union, appoint for that purpose in writing.
- (3) The seal shall be kept in such custody as the committee of management directs, and shall be used only by order of the committee, and in the presence of a majority of the committee, who shall sign any instrument to which the seal is affixed.
- (4) A register of members of the union shall be kept by the secretary.
- (5) A person shall not cease to be a member of the union unless he has given at least three months' written notice to the secretary, and has paid all fees and dues owing by him to the union.
- (6) The secretary shall be the registered officer of the union.
- (7) The trustees (or secretary) shall be the officers to sue and be sued on behalf of the union.
- (8) The delegate or delegates for the purpose of recommending a person as a member of the Industrial Arbitration Court shall be elected by the union at [*here insert the class of meeting which will elect delegate.*]

Registration with the Registrar of Trade Union.

It will expedite registration under the Arbitration Act if, when the rules have been altered so as to comply with Schedule I, the new rules are taken to the Registrar of Trades Unions, who will then register them as rules of the trade union. Formal application can then be made to the Registrar, Industrial Arbitration Act.

Leave to Adopt Rules.

If, however, it is impracticable to get the additional rules passed by a general or special meeting of the union, the committee of management may apply to the Registrar for the Governor's leave to adopt the additional rules.

The Formal Application for Registration.

When the union has put its rules in order and registered the alterations with the Registrar of Trade Unions, the committee must make application for registration under the Arbitration Act by filling in the prescribed application forms and by forwarding with the application—

- (a) A list of the officers and general committee of management of the union:
- (b) Two copies of the complete rules:
- (c) The certificate of registry of the union under the Trade Union Act of 1881.

Registration.

If the application and rules are in order the Registrar will register the trade union as an industrial union of employés, and will issue a certificate of incorporation.

Effect of Registration.

Upon the issue of this certificate the members of the union become a body corporate by the name mentioned in the certificate.

Seal.

After registration it will be necessary for each industrial union to possess a corporate seal, on which appears the name of the union.

Forms.

All forms may be obtained from the Registrar free of charge. There is no fee for registration.

Address.

The Registrar, Industrial Arbitration Act, St. James' Chambers, King Street, Sydney.

Model Rules for Association of Employers.

The Registrar has also framed and issued a set of model rules which may be adopted by those associations of employers carrying on similar businesses, which are being formed for the purpose of effecting registration under the Act. These or similar rules, which, by Schedule 1 are required to be adopted by classes of employers registering, are only for the purpose of conducting the affairs of the associations as industrial unions. Rules made for the purpose of registering need not deal with other matters which are of interest to the persons who are associated, though there is no objection to their containing such provisions if the members so desire.

The Certificate of Incorporation of Industrial Unions.

When the requirements of the Act as to registration have been complied with, a certificate of incorporation is issued to the applicant, and the association, company, or trade union, as the case may be, becomes, for the purpose of the Industrial Arbitration Act, a body corporate by the name mentioned in the certificate. As a body corporate it must possess a common seal as evidence of its acts as an industrial union. It may also, as such a union, purchase, sell, or otherwise deal with any real or personal property. At the same time it is expressly provided that its existence as a corporate body under this Act will not make it or any of its members liable to any process of law or to any obligations other than those which it incurs in the exercise of rights and powers conferred by the Act.

Industrial Agreements.

An industrial union when formed may enter into an agreement with another industrial union or with an employer. This bargain may be for any term not exceeding three years, and when it is filed with the Registrar it becomes as binding in effect as an award or order of the court. It may contain such provisions as to the terms and conditions of employment as may be agreed upon between the parties, and may provide in any manner for the enforcement of the conditions thus laid down. It binds also all persons who were members of the union during the currency of the agreement in respect of anything done under it, and any breach may be punished either in the manner laid down by the agreement itself or by the Court of Arbitration, which has exclusive jurisdiction in respect of the agreement. It may, however, with the consent of both parties, be wholly rescinded or varied at any time.

The Court of Arbitration.

The Court of Arbitration will consist of a president and two members. The president of the court must be a Judge of the Supreme Court, and it has been announced that Mr. Justice Cohen has been offered and has accepted the position. The two members (who are not yet appointed) will be appointed by the Government—one from persons recommended by delegates of registered unions of employers, and the other from persons recommended by delegates of registered unions of employés. The two members sit for three years, but are eligible for re-appointment.

Powers of Court.

The court so constituted will have very wide powers of hearing and determining industrial disputes and industrial matters. An "Industrial dispute" means "Dispute in relation to industrial matters arising between an employer or industrial union of employers, on the one part, and an industrial union of employés or trade union or branch, on the other part, and includes any

dispute arising out of an industrial agreement." "Industrial matters" mean "Matters or things affecting or relating to work done or to be done, or the privileges, rights, or duties of employers or employés in any industry, not involving questions which are or may be the subject of proceedings for an indictable offence; and, without limiting the general nature of the above definition, includes all or any matters relating to—(a) The wages, allowances, or remuneration of any persons employed or to be employed in any industry, or the prices paid or to be paid therein in respect of such employment; (b) the hours of employment, sex, age, qualification, or status of employés, and the mode, terms, and conditions of employment; (c) the employment of children or young persons, or of any person or persons, or class of persons in any industry, or the dismissal of or refusal to employ any particular person or persons, or class of persons therein; (d) any established custom or usage of any industry either generally or in any particular locality; (e) the interpretation of an industrial agreement." The Attorney-General has stated that the court will probably be able to make its awards retrospective.

The court will hear and determine those disputes according to equity and good conscience. It may admit and call for such evidence as, in good conscience, it thinks to be the best available, whether strictly legal evidence or not. It may regulate its own procedure in every respect. It may order the payment of costs by either party, providing that, if a counsel, solicitor, or agent is employed, the costs of such service are paid by the party employing the counsel, solicitor, or agent. It may dismiss a proceeding where it thinks that the matter should and can be amicably settled. It may bring before it as parties any persons it thinks proper. It may sit in any locality, and may call in the aid of expert assessors and of such witnesses as it thinks fit. The President of the court will have extensive powers of settling all preliminary matters in order that a dispute may be the more speedily and effectively disposed of.

Reference of Industrial Disputes to Court.

An industrial dispute may be referred to the court only by an industrial union (or, in exceptional cases, by the Registrar), and, except where it is impossible to bring all the members of a union together, in which case certain officers may act, a dispute may be referred by the union only on the authority of a general meeting of the members of the union.

Regulations were published in the *Government Gazette* setting forth the forms in which industrial disputes must be referred to the court, and providing:—

- (1) That the facts upon which the industrial dispute or other matter is based, and the questions arising upon such facts in respect to which the determination of the court is sought, shall be shortly set out in the resolution and also in the application; and
- (2) That the application shall be accompanied by a minute of the resolution under the seal of the union applying, and also by a solemn declaration in the form prescribed by the regulations.

Dismissal and Employment of Unionists.

There are two further provisions in the Act deserving special notice. One is contained in clause 35, which is as follows:—

"If an employer dismisses from his employment any employé by reason merely of the fact that the employé is a member of an industrial union, or is entitled to the benefit of an award, order, or agreement, such employer shall be liable to a penalty not exceeding twenty pounds for each employé so dismissed:

"In every case it shall lie on the employer to satisfy the court that such employé was so dismissed by reason of some facts other than those

above mentioned in this section : Provided that no proceedings shall be begun under this section except by leave of the court."

And the other is that indicated by clause 37, as follows:—

"The court in its award or by order made on the application of any party to the proceedings before it, at any time in the period during which the award is binding, may—

"(a) Prescribe a minimum rate of wages or other remuneration, with provision for the fixing in such manner and subject to such conditions as may be specified in the award or order, by some tribunal specified in the award or order, of a lower rate in the case of employes who are unable to earn the prescribed minimum; and

"(b) Direct that as between members of an industrial union of employes and other persons, offering their labor at the same time, such members shall be employed in preference to such other persons, other things being equal, and appoint a tribunal to finally decide in what cases an employer to whom any such direction applies may employ a person who is not a member of any such union or branch."

It will be noticed that the sub-paragraphs of this clause (37) cannot have operation until such time as the court, in an award or order, gives directions to the effect contained in the paragraphs. Sub-paragraph (b) is probably not intended to, and will not, affect persons already in the employment of an employer, but only persons proposing to enter upon fresh employment with the employer.

Choice of Delegates.

A regulation was recently issued (see *Gazette* of February 7) providing that the secretary of every industrial union which has chosen a delegate or delegates for the purpose of recommending persons for the office of member of the Arbitration Court (or such other officer as the union has authorised on their behalf), shall, on or before the 8th (since extended to the 15th) day of March next, notify the fact of such choice, together with the name or names of the persons so chosen, to the Registrar. Forms will be provided by the Registrar for that purpose.

Formation of Court.

As a reference to Schedule 2 of the Act will show, the delegates here referred to, when chosen by the unions, will meet together in two classes, composed of employers' and employes' delegates, for the purpose of recommending a person or persons for the office of a member of the court. As it would probably take some two weeks to secure this vote of the delegates, the 15th of March has been fixed as the last day for receiving the names of the delegates, as even then the court cannot be constituted before the beginning of April. All bodies, therefore, who desire to have a voice in the election of delegates and the recommendation of members of the court have been asked to effect their registration before the 8th of March, at the very latest. Nothing, however, in the Act will prevent the registration of unions at any subsequent period. At the date of writing, 8th March, some fifty trade unions have effected, or are in process of effecting, their registration with the Registrar; and, as before stated, there is considerable activity among employers engaged in effecting the same object.

Final Note.

The Attorney-General has recently, on behalf of the Premier and the Government, earnestly appealed to employers and employes not to cause existing conditions of industrial employment to be disturbed pending the constitution of the court.—*Labor Bulletin*.

Journal of Agriculture

AND

Industry.

No. 11. REGISTERED AS

JUNE 1, 1902.

[A NEWSPAPER.]

VOL. V.

NOTES AND COMMENTS.

May has again proved a disappointing month, being exceptionally dry and warm. The past two months have given us weather very similar to that experienced during the same months last year. There has been an entire absence of serviceable rains, with high temperatures for the season of the year. Seeding is practically finished except in the latest districts, and a good soaking rain is anxiously looked for. Pasturage is very scarce, and the lambing season has in many districts been a disastrous failure. The dairying industry has also been seriously affected by the dry weather. The greater part of Australia is at present suffering from absence of rain, and the break up of the drought is anxiously looked for by everyone.

Is it true that fallowed land collects and stores water from one season to another? If so, how many ordinary dry years would be required to make fallow land too wet? Is it probable that the failure of crops sown on late-fallowed land is due to the open, loose condition of the subsoil, which promotes almost perfect dryness to the depth to which the ploughing extends? If there were any means by which the subsoil could be pulverised and compressed, would the subsoil become as moist as that which was broken up a year before? Perhaps these questions might lead to investigation by experiment. Of course, nitrifying agencies in the soil, and its condition of humidity or otherwise, would be factors that must be considered at the same time.

If the farmers cannot make a living on the land it means a dislocation of all civilisation, because the farmer feeds the whole civilised world. Then it is the duty of the leaders of civilisation—that is, the Government—to forward the farmers' interests; to aid in training the young people in all the most up-to-date methods of raising products from and upon the soil. The best teaching talent procurable should be employed, and the best and most practical methods of disseminating information must be adopted. Lectures undoubtedly make the greatest impression for the time, but cold print is the most enduring, and whilst a lecturer may tickle the ears of a hundred or so of auditors, the printed sheet can reach thousands upon thousands, and be retained for study during many years.

Mr. W. Farrar forwarded me a pound weight each of Cumberland wheat and Emerald rye, and writes:—"Cumberland wheat is a cross-bred variety which in some places may possibly replace Steinwedel. It is a very little later, holds its grain much better, is a rather better rust-resister, is (like Steinwedel) a weak flour variety, and has the same compact and attractive habit of growth. Emerald rye ripens early with the wild oats, and may be valuable in a hay crop. It produces foliage much softer and more succulent than other varieties of rye, and the stems are of a fresh light-green color, instead of dark blue-green. Seed should be sown early, as it is a winter rye. The plants should be looked over about the time when the ears begin to appear, and any which do not bear the typical color should be removed. This rye requires a cool climate and rich land."

The imported starling is rapidly increasing all over Australia, and may possibly become as great a pest as the sparrow. Flocks of 1,000 or more may be seen occasionally. They are very attentive on sheep, and it is claimed by ornithophobists that they do much good by picking vermin out of the fleeces. Perhaps the benefit may be over balanced by the fact that the birds befoul the wool with their droppings; and, anyway, the owners cannot be congratulated upon the benefits derived from the work done by the starlings in ridding their sheep of a few of the vermin which diminish the value of the wool, impair the health of the sheep, and evidence the stupid neglect of their owners in failing to destroy the vermin by dipping, which operation they are required by law to perform.

The fruit fly in Western Australia apparently is much more to be dreaded than the codlin moth or any other fruit pest except, perhaps, the San Jose scale. It is reported to attack every kind of fruit, even piemelons and pumpkins. The maggots are found in large numbers in each apple, pear, peach, &c., soon converting it to a mass of corruption. Growers who had stored their apples in view of higher prices to be realised later on, when fruit is scarce, have been horrified by the discovery that their cherished stores of fruit were infested by myriads of fruit fly larvæ, which mature rapidly and reproduce their species within a very short time. Their only resource was to pick out the few sound fruits that were left, and sell them at whatever price could be obtained. This pest is a most serious menace to the fruitgrowers of Westralia, and must be vigorously and unitedly dealt with, unless they are prepared to give up all efforts to grow fruit of any kind.

Mules are not as dainty as horses are in respect to their food, but will browse upon many herbs and bushes that horses would not touch. They are hardier and require less attention than must be devoted to horses. The irresponsible humorist of the comic columns in the newspapers must bear blame for the absence of public appreciation of the merits of the mule. The mule is no fool, neither is it vicious, as a rule. Like the horse there are some naturally wicked mules, and some that are made vicious by bad management or evil treatment. Mules live longer than horses, and are far less liable to sickness. They will travel well upon natural roads without shoes, and will pick up a living and keep strength and fair condition where horses would starve. In America mules are very commonly used, and Spain and parts of France are noted for the splendid mules that are raised. In times to come the mule in Australia will be regarded as far superior to the horse for country and bush work.

Carob trees (*Ceratonia siliqua*) produce from 50lbs. up to 3cwts. of pods annually. These are excellent food for all kinds of farm live stock. The tree is very hardy and withstands dry weather. It does well on limestone soils, but is rather difficult to establish. Probably the best way is to melt the solder off old jam tins, place them side by side on a hard floor, fill up with rich sandy loam, put a seed into each tin lin. deep, and water daily until the plant appears. Then plant the trees, without removing the ring of desoldered tin, in the places where the trees are wanted to grow. Plant in rows 6ft. apart, alternately. Some carob trees may have both male and female flowers, but mostly the male flowers are on one tree and the female on another. Many sorts of cattle spice consists chiefly of carob bean meal.

Timber trees and shelter belts should be planted during this month and next. It is wrong to dig holes and plant the trees in them, because the storm water collects in the holes and drowns the roots; when dry weather occurs the soil contracts and leaves a crevice between the walls and the earth in the hole, and the roots become dry and dead. If neither of these mishaps occur the roots will "follow the lines of least resistance," which will be along the walls of the holes, and the plant will become root-bound and will die. The best way is to plough deeply and break up the subsoil thoroughly, if possible. Plant the trees with the roots extended evenly, tread the soil somewhat firmly, and use water afterwards if the soil is not fairly damp. For timber purposes plant the trees 6ft. apart, and thin out a few years later. Shelter belts should be in at least four alternate rows.

There are very many places in this State where water could be diverted from small streams on to rich alluvial flats, upon which immense crops of fodder or other vegetable products could be raised. The rich peaty flats on either side of the Murray could be reclaimed and would soon repay the cost. Creeks and rivulets in the hilly districts could be utilised; and the water that runs to waste after each heavy rainfall could be conserved to a great extent. In many places excellent work could be done in this way by co-operation where individual effort would be too weak to effect the purpose. The little rills of water that pass along should be regarded as streams of gold by the adjacent landholders.

Docking and other similar mutilations of the lower animals is often more a freak of fashion than a matter of necessity. Why should horses' tails be docked? It is not sufficient to say that cleanliness demands it, because a very little effort on the part of the owner will ensure that item. The horse that has been docked suffers agonies from the attacks of flies and other insects. The beauty of the horse is destroyed by the barbarous practice. Why should trap horses wear blinkers, whilst saddle horses and those engaged in ploughing, etc., go without? Blinkers became fashionable because a nobleman had a pair of horses, one of which was wall-eyed. Fashion followed his example by placing blinkers on all carriage horses. It is a pity we do not consider the reasons and necessity or otherwise of many cruelties perpetrated on the lower animals,

The average South Australian has become so accustomed to dyed cheese and butter that he cannot be satisfied with the natural unstained article. He wants a good deal of color too. Much of the cheese is almost red, but no natural cheese is anything but white, or nearly so. Very few people know what the coloring matter consists of, nor how it is made, which, perhaps, is fortunate for them; but when used to excess, as most certainly is the case here, the flavor of the article so colored is by no means improved. Efforts are being made to lower the use of coloring in our butter and cheese, but managers of factories have been compelled to do this very gradually, because the majority of the public demand the strongly dyed articles to which they have become used.

Where sandhills are drifting an immediate effort should be made to stop the evil. There are many plants that can be tried for this purpose. In some cases it may be necessary at first to strew bushes, branches, or other matter on the surface until seeds can be got to start growth. In May or June some rye, barley, or oats could be sown, and the plants will serve to nurse more permanent growths for a time, until they become established. *Pinus maritima*, or *P. halepensis* should be planted in septuple rows to shelter the area that is to be planted with grasses and shrubs. Buckwheat, several kinds of legumes, fescues, medics, melilotus, Jerusalem artichoke, Aleppo grass (Johnson grass), couch grass, buffalo grass, common broom (*Genista scoparia*), *Calamagrostis arenaria*, *Triticum junceum*, golden wattle (*Acacia pycnantha*), *Tamarix gallica*, and many other plants can be grown for feeding stock, but the animals should under no circumstances be allowed to graze or browse upon the plants. The fodder should always be cut and carried to the mangers or feed racks.

THE PROFESSOR OF AGRICULTURE.

Professor J. D. Towar, late of Michigan Agricultural College, arrived in South Australia on May 8, and has since taken charge of the Roseworthy Agricultural College and Farm. Professor Towar was born in Michigan, and graduated at the State Agricultural College. As Michigan is one of the large wheat-producing states of America, and the Professor was brought up on a farm, he has a thorough knowledge of the practical work connected with wheat-growing and stock-raising. As the Professor puts it, there is nothing on a farm that he has not had to do. For eleven years he has been engaged in teaching, and in lecturing and travelling amongst the farmers. He speaks very highly of the American farmers' institutions and of the system of agricultural education in force in that country, and states that there has been in recent years a marked advance in farming methods. There is no doubt the Professor will be glad to avail himself of the Agricultural Bureau organisation to bring himself into touch with the farming community, and to learn more of our climatic and soil conditions.

During nearly eight months' interval between departure of Professor Lowrie and arrival of Professor Towar the work of the Roseworthy Agricultural College and Farm was ably conducted by Professor Perkins, State Viticultural Instructor and Oenologist. Professor and Mrs. Towar received a formal welcome by the staff and students of the college on the evening of May 29, when a number of ladies and gentlemen from Gawler and neighborhood were also present. Professor Perkins acted as spokesman on the occasion. Professor Towar expressed pleasure with the cordial reception accorded himself and Mrs. Towar by all with whom they had come into contact.

THE IMPORTATION OF TASMANIAN APPLES.

BY GEO. QUINN, CHIEF INSPECTOR OF FRUITS, &c.

Owing to the extreme scarcity of apples and pears the local fruit dealers have been compelled to resort to Tasmanian supplies to meet the demands of their customers. The chief varieties imported are Scarlet Pearmain, which is probably identical with our Scarlet Nonpareil; Dutch Mignonne (known here as Adams' Pearmain), French Crab, Sturmer Pippin, Northern Spy, New York Pippin (grown here as Cleopatra). The New York Pippin, Sturmer Pippin, French Crab, and Adams' Pearmain varieties have carried well on the whole. The other kinds arrive here in a very indifferent condition. The pears consist chiefly of Vicar of Winkfield, and they have carried in a somewhat unsatisfactory manner. The fruits are packed in the hardwood cases, chiefly of the Peacock shape. They are lined with newspaper only, which is not sufficient to protect them from this hard unyielding timber. There can be no doubt that a few pence worth of wood wool, used as packing material in each case, would result in the contents arriving here in a much better state of preservation, and more than repay the outlay thereon. On arrival at Port Adelaide the consignments are taken to the departmental fumigating works, and each case is opened and the contents spread out on trays. The inspectors then handle each individual fruit, packing them back into their respective cases, if clean. The diseases noted so far have been *Fusicladium dendriticum* and *pyrinum*, mussel scale (*Mytilaspis pomorum*), codlin moth, and a small green caterpillar, probably the larva of a leaf-rolling tortrix moth.

No objection is raised to the importation of the fungi named above. All specimens infested with mussel scale are dropped into separate cases, and afterwards fumigated on trays for one hour.

All fruits showing evidence of codlin moth attacks are cut open to ascertain whether the pest is present. During the last three weeks upwards of 1,000bush. have been dealt with in this manner. Out of these 58bush. have been sorted and fumigated for mussel scale. The moth-injured specimens met with from time to time made up not more than 3bush., and only one solitary codlin caterpillar was found. There is a valuable lesson in this, because while in every consignment and in every variety odd moth-injured specimens were found, clearly indicating its presence in the orchards from which they were gathered, yet the proportion was so small that it tends to confirm the statements made by Tasmanian orchardists respecting the successful results of the methods adopted by them for keeping the pest in check. The interiors of the cases were examined carefully from time to time, but no caterpillars were found attached therein.

It is often stated that local growers are prosecuted when caught with the affected apples, but importers are allowed to sort them out. In this matter the importer is at a disadvantage, for, while the grower may sort them out with the cheapest labor obtainable before selling them, the importer is compelled to pay eighteen pence per hour for each inspector engaged in sorting over his fruit prior to its admission to the State.

The mussel scale is not a "new pest" by any means to South Australia; but fortunately its ravages are limited here by some unexplained cause. Notwithstanding this, no risks will be taken in admitting more of it. As the season is just beginning, it may be anticipated that a considerable trade in Tasmanian apples will be done during this winter. During the average season, however, the freight, inspection, and other charges will debar much competition when our own crops have been ordinarily abundant.

SPRAYING TESTS FOR CODLIN MOTH.—NEW ZEALAND EXPERIENCE.

The *New Zealand Farmer and Stock and Station Journal* of May, 1902, contains an account of some tests made in spraying for the suppression of codlin moth, which, in the present state of the controversy over this subject here, should prove interesting to our apple growers.

The tests were carried out by Mr. W. A. Boucher, Government Pomologist, under the supervision of an outside committee of interested persons. The spraying was begun towards the end of October on the early setting kinds, and continued until February 18th. Altogether eight sprayings were given to some trees. Throughout the season only a moderate rainfall was recorded; but rough weather made the task of applying the insecticides one of considerable difficulty.

The following mixtures were used in the tests :—(1) One pound Paris green in 200galls. of saturated solution of limewater; (2) the same repeated with half a gallon of resin wash to each 18galls. of the mixture; (3) 1lb. white arsenic dissolved in 2lbs. washing soda, and then added to 700galls. of lime-water; (4) 1lb. white arsenic dissolved in 4lbs. washing soda, and mixed with 400galls. of limewater; (5) 1lb. of arsenate of lead to 12galls. of water, in which 1lb. treacle had been dissolved. The last-named solution burned the foliage severely, through, it is stated, being wrongly prepared.

The soil around the trees was kept well cultivated, and in one section pigs were enclosed with wire-netting. The pigs ate all weeds and windfalls, though these were supplemented with bought foods, such as pollard and bran. On this mixture the pigs were kept in a healthy and thriving condition.

A specimen tree of Cox's orange pippin, sprayed with the arsenite of soda, which was stripped and the ripened fruits counted and examined minutely, yielded—sound apples, 848; moth-damaged apples, 261; total, 1,109. This gives upwards of 75 per cent. clean fruits. Another tree of the same variety, sprayed with Paris green, when stripped yielded 667 sound apples and 81 moth-injured specimens, or about 90 per cent. of sound fruits. The Chairman of the Committee in his report says—"In examining the fruits it was observed that many apples showed signs of having been attacked by the moth; but the application of the insecticide had evidently cut short the grub's power for doing serious damage, for it had in such cases only penetrated a very short way below the outer skin, and then perished. Such apples when cut open were found uninjured inside. This stoppage of the injury was no doubt due to the spraying. These apples, nevertheless, though sound commercially, were included with the 'mothy' when counting."

The report concludes—"Practically for commercial purposes the fruit in the orchard was free from codlin moth. No doubt the spraying of last year helped considerably in bringing about this result, although the condition of the fruit last season did not show the good that was being done in the destruction of thousands of grubs which would otherwise have had to be dealt with as egg-laying moths this season."

These results and observations tally pretty closely with those obtained here. In commercial spraying here, doubtless owing to the almost complete absence of heavy continuous rain during the period when the work is in progress, much less spraying has and will continue to prove effective in South Australia, which is another point in favor of the South Australian orchardist.

ROADSIDE TREE-PLANTING.

BY THOS. HARDY.

Reading the following in the *Australasian* of January 25, 1902, reminded me of a project I have considered for a long time in regard to tree-planting on a large scale alongside the main and district roads all over the State:—

THE CONDOBOLIN DISTRICT (N.S.W.).

The fact that so complete a change for the worse has taken place in the character of all edible grasses, herbage, and other valuable forage plants growing in this district during the past twenty-five years has become so notorious that all sorts of theories are being put forth in an endeavour to account for the change. The real source of the trouble, however, has not yet been ventilated, but may be concisely stated as "overstocking and indiscriminately ring-barking." The country when first stocked with sheep, some twenty-seven years ago, carried such an extraordinarily heavy crop of succulent grasses and herbage that it was found almost impossible to put enough stock on it to eat it down. And as the seasons previous to 1880 were favorable, and the growth of vegetation generally so wonderful, landholders were led to form optimistic opinions as to the carrying capabilities of their holdings, which led to the consistent and general overstocking which obtained in the district generally, the results of which may now be seen in the hundreds of thousands of acres of bare, scalded, plain country all over the district—plains which at one time carried heavy crops of the best description of grasses and herbage, interspersed with salt and cotton bush, the whole being of the most fattening description possible; whilst all these large areas grow now is patches of comparatively worthless grasses and weeds, in isolated places where the surface soil has not been completely blown away by the prevailing westerly gales. If further proof of the evil of overstocking be required, those places in the district which have never been overstocked, and which have consequently escaped loss, may be pointed to. The evils of indiscriminate ringbarking are not so easily proved, but the killing of everything green, and which holds moisture over vast areas of country cannot be good, as after all the moisture contained in the vegetation has disappeared, and the weather continues dry, the whole of these areas become as dry and arid as any sand bed, and the endeavor to turn large areas of timbered country into plains must, we think, always be a risky business. And the fact that the past seven years have been the driest ever experienced is *prima facie* evidence that the climate, as well as the vegetation, has been deleteriously affected by the wholesale and injudicious destruction of timber which has taken place all over this district during the period above named.

My proposition is that district councils take it in hand to select suitable roads in their districts and plant trees on both sides at 100yds. apart. The trees to be raised in the Government nurseries and supplied free of charge. The holes to receive them may in many cases be dug by the owners of the land adjacent; they should be not less than 4ft. square, 12in. deep taken out and the bottom broken up another 6in, and the trees not less than 13ft. from the fences, leaving 40ft. clear for the roadway—quite sufficient in a 66ft. road. An arbor day could be instituted to do the planting, and there would be enough people interested to carry it out successfully. The kind of trees to be planted should be those that give the greatest amount of shelter from wind, and likely to prove valuable as timber. In any dry hillside or limestone country there is no better tree than *Pinus halpensis*, or "Aleppo pine"; it is hardy, quick-growing, cattle do not care for it, it makes a dense low breakwind, is not killed by drought and heat like the *Pinus insignis*, and the timber is valuable for many uses. The sugargum (*Eucalyptus corynocalyx*) is a quick grower, but is too bare and lanky for a good breakwind. Probably some of the other eucalypts may be more suitable. Redgum should be planted in good ground near creeks. Some ornamental trees should be planted for variety, such as English and American elms, ficus, robinias, carobs, &c. All these should be specially grown for the purpose, and be of fair size and well rooted, and not the poor plants usually sent out from the Government nurseries. The greatest care should be taken in lifting and conveying them, so that they do not dry up in transit. The greatest expense to be incurred will be in providing guards to protect the trees from cattle and mischievous boys,

and I will try to show how this can be done and the cost met. The best and cheapest guard I know of is made with four pieces of jarrah 2in. x 3in. x 8ft., made into a square of 22in. Two 7½ft. lengths of 36in. wire-netting will cover it completely, and the cost will be not more than 8s. a tree. I allow that if the trees are properly planted, watered, and cared for, these guards will not be needed for more than three years for each tree, and will stand removing and using again at least four times if ordinary care is taken of them. They should be made for one side to open when to be removed. In three years after the first lot of trees are planted I propose to plant one tree midway between each, and at six years another, and at nine years a fourth; the trees would then be only 25yds. apart, only a little more than the width of a Government road. If a piece of country, say ten miles square, were planted, it would, on the old surveys where a road surrounds every four 80-acre sections, give a distance of about 320 miles of roads and intersect about 82,000 acres. At thirty-five trees to the mile there would be 11,200 trees for the first planting, and when completed in nine years, no less than 44,800 trees. I think that a man with a horse and dray and a 400gall. tank, at 10s. a day, could take care of and water the year's planting several times. The next two years' treatment would be only clearing away the weeds round each tree and putting a stake to each one requiring it. The cost of the guards at 8s. per tree, say £4,480, might be raised by a loan, or advanced by the Government. A rate of 1d. per acre on the land would meet the interest at 3½ per cent., and more than pay for the watering by £15, and allow more than sufficient for taking care of the trees during the intervening years between the plantings. I do not think that many landholders would object to pay this rate when they consider the benefits to be derived from it, among which would be an increased rainfall and all the benefits from it, protection for stock, crops, and even the land itself, from winds and storms, besides creating a valuable asset in timber in a few years, which should be sold as it comes to maturity and the proceeds credited against the rates for that particular part of the district, after making provision for replanting in place of trees sold, and eventually a fund for paying off the money borrowed or advanced.

I have said nothing about the appearance this dry country would have if the roads were planted generally all through the treeless country in the north. Of course the scheme I have outlined will want further elaboration, but I believe that it is not only practicable, but will be a good investment for the money expended.

TREE-PLANTING AND TIMBER SUPPLY.

By F. E. H. W. KRICHAUFF.

No. 7.—“Arbor Day” at Schools: What it has done in America and what it can do here.

It is most desirable that public sentiment in South Australia should be vigorously excited to follow the practice of a few of our municipalities and several of our public schools in regard to the planting of trees, for this would promote the public welfare in no narrow or selfish spirit. The establishment of clusters of trees, or in any other way, will provide cheerful spots in which the whole community has an ownership, and, if carried on in large blocks over our State, it may avert most serious consequences, and will at least add to the public wealth in measurable time. How thankful are hundreds of persons for the trees planted in the squares of Adelaide, where they spend their dinner-hour. And is it not a pleasure for travellers to pass through the main street of Jamestown, with its trees planted in the centre?

There are yet many schools in South Australia without a bush or tree near them. These places look bare, bleak, and inhospitable; hot and cold winds blow there with unchecked violence, and, while the teacher, who may have his domicile under the same roof, must feel uncomfortable by such surroundings, the pupils may frequently prefer the stuffy atmosphere of the schoolroom to the fresh air of an unprotected playground. Then there are applications for shelter-sheds where nature might be induced to provide an attractive and far healthier shelter from heat, cold, dust, and light showers. Such an adornment of school-grounds must evidently appeal to the finer nature of the children, considering that such a large portion of their most impressionable life is spent in and near the school.

The main obstacle, unless it be too small an area, to properly improve school grounds is perhaps public indifference, even where the teacher, who may soon be sent elsewhere, will give every assistance and attend to any plantation during the vacations. The Forest Department provides the trees, and the unavoidable trifling cost could be easily obtained by means of a tea meeting. My plan would be to leave the front pretty open to allow a view from it and into the exterior landscape, and to have only a few ornamental shrubs or trees planted there. After allowing sufficient room for a playground, plant the sides and the rear in an irregular way with a variety of trees, so far as the position and the soil permits this, and some shrubbery around objects and erections that should not be visible. It is good to have the playground sloping towards the plantations, so that the rain may run off and water trees and shrubs. Where the soil is of a very dry nature large holes made beforehand may with advantage be filled before planting with water, and if this soaked away, once again to fill them. After planting, water and keep the soil in fine tilth like a mulch. Allow no weeds or grass to grow for some years. There are, however, several serious mistakes frequently made. First of all roots and top are not properly balanced; a tree loses probably one-fifth of its fine fibrous roots, and the tops must therefore be shortened or any branches removed. The roots are frequently left too long exposed to the sun and dry air instead of being dipped into a puddle or kept moistened and covered up; the soil is not packed firmly around the roots. Stable manure must not be used, although some Thomas phosphate and kainit may be mixed with the soil. Do not plant shallow, or with very wet or lumpy soil, and leave the tree in this climate rather standing in a basin.

How important the planting at arbor days is in some countries is more especially shown in Sweden and the United States. Sweden is considered well-wooded, and yet we are informed that school children planted last year 600,000 trees. In the United States, however, arbor day did not remain a holiday for schools alone, nor should it here, to which the pupils look forward long before, and at which a few dozen trees are planted. To what better purpose can the unsold allotments suburban to townships be used than for tree-planting? There must be many hundreds of them, and, in turn, if so planted, they would protect the gardens and fruit trees planted on the town allotments.

Let us see what arbor day has already done for Nebraska beyond pecuniary computation. Although a good commencement had been made when I passed through in 1882, ever so many thousands of acres—formerly bleak, almost worthless—bear now hundreds of millions, nay, probably by now more than a billion, of trees, influencing even the climate, and resulting in an improvement in the crops of the neighborhood. There should be nothing Utopian in a new country to follow the example of Nebraska. In fact, the time must come that all will see with the eyes of those who now press this matter on public attention. Professor Geo. Mall says—"The broad and beneficent results flowing from arbor days are not to be estimated in their sum total by the impressive array of cold figures, not even though they reach the enormous

proportions of 605,000,000 trees planted up to 1896 in the single state of Nebraska, and now thriving there, where a few years ago none could be seen except along streams, and this was called 'the Great American Desert,' where, seventeen years before, geographies said trees would not grow, and now it is the leading state of America for tree-planting."

I will also give a few extracts from an address delivered in 1887 by the founder of arbor day (H. J. Sterling Morton) at the State University of Nebraska:—"Ordinary holidays are retrospective in honor of something good or great; but arbor day is not like other holidays, it sketches, outlines, establishes the useful and beautiful of ages yet to come, etches upon our prairies and plains gigantic groves and towering forests of waving trees. Their beauty will compel the admiration and gratitude of men and women now unborn. It is the sole holiday of the human family which looks forward and not backwards. Grecian civilisation was a tree-planting civilisation—it illustrates how marvellously trees and learning have always been intimately associated together. Forests and our English ancestry are indissolubly connected; the Druids first planted groves in England. Queen Elizabeth was amongst the first English-speaking advocates of forestry. The small trees of to-day's planting will develop into the groves and forests of the future. They will contribute the material for ships and railroads, business edifices, and the homes to be used by those who are born in coming centuries." And what are the Druids of the present day doing who claim that ancient name, which, according to Pliny, means an oak? Why, it would be well for them to plant a grove of oaks in which they could hold their picnics instead of going begging for permission to keep it in other grounds! Mr. Morton has doubtless been much pleased when hearing that the King of Greece and Princess Sophia are adding again to Greek civilisation by planting largely, using their own lands and spending their private means.

I suggest to our local agricultural societies to offer premiums to the men who properly plant the largest number of forest trees during any three years, or at any district arbor day, as was, and is perhaps yet, done in Nebraska and elsewhere. Some of our wealthy men also might offer premiums. Such district arbor days would soon be welcomed with as much zest and glad expectation as they are now in most American States, even where there is no great scarcity of forest trees and groves in the neighborhood. As years go by the celebration of each new arbor day will give an additional charm to visitors and actors in the planting of trees. Larger and larger numbers become naturally interested in previous plantations which may be near, or, if possible, adjoining the land to be planted on the occasion. Besides the curiosity and pleasure of seeing the trees again which they planted years ago, and which may have grown to great dimensions, they are sure to meet ever so many old schoolfellows. Wherever such plantations belong to any township it may be interesting to be informed how valuable such forests may become to the inhabitants from the example of some German towns. Some of these require no district taxation. At Freuenstadt, for instance, they have been since 1875 in the enviable position to be able to pay to each of its about 1,300 burghers a sum varying from 25s. to 55s. from the profits of the forest owned by the town. Another instance is Saaldorf, where the eighty-four ratepayers each receive every year wood and turf for burning of the value of £5, and lately £830 was divided amongst them, or nearly £10 to each, as surplus from the sales of timber out of the village forest. A further sum of £3,000 is still in hand, and the village is of course free from debt.

On the authority of the *Register* I state also that Orsa, in Sweden, has sold in the course of a generation trees of the value of £1,150,000. By judicious replanting they have provided for a similar income in thirty or forty years. Now the inhabitants have to pay no taxes, and schools, railways, and telephones within the boundaries are free.

Land is here less valuable, trees grow when well planted and in a suitable position more quickly than in Europe, and timber is sure to be not less valuable than there, where on medium soil interest at the rate of 3 to 5 per cent. is obtained upon the value of the soil. I hope that before I close my eyes I may be able to arouse sufficient interest in this important matter for the future welfare of the State of South Australia. In the United States there are sixteen forestry associations, with a great increase in membership of late; three schools of forestry, and forty-eight other institutions giving instruction in forestry, showing how widespread and vigorous is public opinion with reference to forestry.

Frequently an objection to extensive plantations in South Australia has been made on the ground that we cannot grow timber trees to advantage for our most needed soft timber. The answer to this is, that we must probably always import soft timber; but we must counterbalance this by growing our fine hardwood timber-trees in such quantities to be able to export largely. There will, doubtless, be always eager competition for such timber as soon as it becomes well known. As yet no adequate conception of the value of a hardwood forest is general in our State. West Australians know the value, but I fear will destroy their splendid natural forests without planting again. It is beyond a doubt that the growing of suitable trees is a profitable enterprise. Prices are high enough for profits at present, and are bound to improve; but the long-time nature of the investment adapts it for large operations, in the first instance to the Government, or else to companies who can employ a competent forester, and subsequently expect loggers to carry on lumbering.

FARM HINTS FOR JUNE.

BY THE EDITOR.

"Wheat loves a firm bed," which does not mean a compact solid bed, but one that will allow of the roots progressing readily amongst its body. The bed should have a blanket on it, to prevent the moisture escaping the lower bed. If the soil is caked on the surface it will draw moisture from below, and the sun and dry air will carry it away. The blanket of loosened soil on top prevents that evaporation, and also allows the air to penetrate, thereby promoting absorption of moisture from the air, and also benefiting the roots, which cannot live without air and moisture. In order to provide this necessary blanket the harrows (or a horse hoe if the crop has been drilled) should be run over the crop once or oftener during its early stages of growth. A few plants may possibly be destroyed, but the loss will be compensated a hundred-fold in the increased luxuriance of the remainder.

Where "hard pan" exists in any paddock, caused by the sole plate of the old-fashioned ploughs and the continuous trampling of the teams in the old furrows, an effort should be made at the earliest moment to break it up and pulverise the lumps. Care should be taken to avoid turning this indurated subsoil on to the surface. If the "cake" is not pulverised it will probably be the cause of a hollow seedbed, and any crop grown upon it will wither off when the hot, dry weather comes—one of the forms of so-called "takeall."

The early-maturing varieties of cereals should be sown last. There are now several varieties of wheat that are early, prolific, rust-resistant, and of first milling quality. It is a mistake to sow any kind that is rust-labile when the above can be procured.

No seed wheat should be sown—even if apparently quite clean—until it has been pickled to prevent bunt. Bluestone is reliable in killing the bunt spores; but the bunt balls are not easily penetrated by the pickle, so that they may be

smashed in the seed-sower or drill, and will reinfest the machine and the seed. The better plan to pickle is, to provide a tank and baskets, three-parts fill the tank with a solution of 6ozs. to 8ozs. of bluestone in each gallon of water, immerse the basket in the solution, drop the seed into the basket, skim off the bunt balls and rubbish, and drain the seed on a table, the lower end of which projects over the tank. Dry the seed on a floor or sheet, and do not sow it until at least forty-eight hours after pickling.

Great care should be taken to have the seed-drill or the seed-sower thoroughly cleaned and disinfected after and before sowing. The coulters and all parts that come into contact with the seed should be disinfected with strong bluestone solution after all earth, &c., has been removed.

Plant Jersey tree-kail, 1,000-head kail, cow cabbage, &c., in lines 6ft. by 4ft. for feeding stock. These will be also of great value for feeding poultry of all kinds. If there should be an excess of these, the leaves can be ensiled with chaffed straw or hay in alternate layers, one foot thick. As much farmyard manure as can be spared from the heap should be worked into the deeply-worked soil, and if a little water can be used now and again some very heavy crops will be produced.

Prepare land for sowing with beets and mangolds next month. The soil cannot be pulverised too deeply, and plenty of manure will benefit the crop. If the soil is somewhat salt it will be good for these plants. For deep soils the long varieties of mangolds will be best. In shallower soils sow globe varieties of mangolds and any sorts of beet. Sugar beet can be recommended for feeding cows and pigs. Frequent hoeing is beneficial, and it will be necessary to single the plants, because two or three seeds are usually enclosed in each husk, or capsule.

Sunflowers make good fodder if sown thickly, and if given more room they will give a heavy crop of seeds upon suitable soils, in addition to a certain quantity of forage. This plant will do well on saline soils, and requires a good deal of potash.

For carrots and parsnips a deep sandy loam, rich, but not recently manured is necessary. Parsnips will thrive in a rather denser soil than will suit carrots. Both should be grown in rows 1ft. x 6in. apart. When quite young the plants can be transplanted if great care is taken to avoid bending the roots when replanting. Frequent hoeing and regular removal of weeds is required. Parsnips are particularly useful for cows and carrots for horses, whilst both are generally acceptable for either class of animal.

Sow broad beans in double or triple rows, 3ft. apart, with 6in. between the plants. These crushed are valuable for horses and pigs, as well as nice when shelled green for the table.

Peas will thrive almost anywhere. Sow in drills 30in. apart, and use some super. as a stimulant. This is a cleaning and enriching crop that can be followed with wheat or other cereal. The peas can be gathered in the straw, stacked, and fed whole to the pigs. Sheep will gather up all waste on the field.

A few acres close to the homestead should be thoroughly broken as deeply as the ordinary farm implements will go, and a good deal of farmyard manure worked in. Then sow as many kinds of nutritious grasses and herbs on it as are likely to grow, and use this piece as a run for the fowls and any others of the farm animals that will appreciate green food during the greater part of the year. Portion of this paddock should be devoted to raising vegetables and fruit for the farm table. No one can know, until he has tried several times, what plants can be grown in this way. There are no farms where profitable wheat and hay crops can be raised but where vines, peaches, apricots, melons, pumpkins, and even cabbages and onions can also be grown with proper care.

Mustard and rape are crops that should be tried on at least a small scale, both for feeding sheep, pigs, &c., and for the green feed which is produced quickly and abundantly. Three to 6lbs. of seed is enough of either to sow an acre broadcast. If mustard is grown for seed do not plough the land until next spring, after the fallen seeds have germinated. If ploughed deeply under they may retain their vitality for many years, until brought near to the surface.

Plant sugargums, pines, and other suitable trees in clumps, or in several rows close together. If it is desired to sow the native pines it is better to secure the cones some time about February, and bury them at intervals 2in. deep in sandy soil; or lay them in the sun on a sheet, and in a few days the seeds will drop out and can be sown on sandy soil.

Do not fail to provide shelter for the live stock of the farm as well as for the wagons, carts, and implements. When animals suffer from cold, exposure, or from heat it is always at the cost of their good health and condition.

Lucern may be sown at once on well-prepared land in any locality where night frosts are not early or severe. The young plants will not withstand frost, but when the roots have a good hold lucern will live through a white frost. In cold localities the land may be well prepared now, and the seed sown at the end of September next.

Rough stony land in some localities will grow wattle bark. Except in the South-East, the best wattle to grow is *Acacia pycnantha* (golden wattle). Scald the seed, wrap it in flannel that is also saturated with boiling water, place it by the fireside for three or four days until the seeds swell, then plant single seed at distances of 3ft. apart each way and not more than 1in. deep.

POULTRY NOTES.

BY D. F. LAURIE.

NOTE.—Letters of inquiry, &c., should be addressed to me, c/o Engineer-in-Chief's Office, Adelaide, enclosing stamped envelope if reply required.

Poultry Diseases, No. 7.

FEATHER EATING is more common among birds in close confinement, and is often the result of improper or insufficient feeding and lack of vegetable food, with consequent over-heating of the system. Again, the habit may be and is often developed accidentally. I have seen a small piece of raw liver fall on the crest of a Houdan and in endeavoring to pick it off a hen plucked out a half-developed quill, and thereby caused bleeding, which always excites fowls to peck. There was some trouble before the habit could be checked.

Treatment.—Provide plenty of fresh water and put a little Douglas mixture in it; give plenty of vegetable food, especially chopped lettuce and onion, and see that there is a full supply of hard sharp grit. As idleness predisposes to vice, it is as well where possible to throw down some straw or cocky chaff, and scatter a little grain therein, the scratching occupies and exercises them. Hanging up a cabbage for them to peck at is also useful. The only certain check, next to the axe, is the poultry "bit," about which such a fuss was made in America a decade ago. There is some mystery attached to this bit, according to some people, but the application is simple enough. Take a piece of flexible binding wire, about $\frac{3}{4}$ in. long, bend it round a pencil in the form of a split ring; the exact size depends on the beak of the bird; the ring is then fastened round the top mandible or beak, the ends being pressed into the nostrils so that it cannot fall or be scratched off. This ring will be just thick enough to prevent the bird from closing the beak, and, while it can feed and

drink, cannot grip a feather. In time a cure is effected. It is also imperative that perfect cleanliness is observed, as fowl lice irritate the birds to such an extent that the vice may be caused through efforts to get rid of the vermin causing bleeding and destruction of half sheathed feathers.

FRACTURES.—Injuries to the spine or any principal bones of the frame cannot as a rule be remedied, the former never. Fracture of the wing is rather awkward, and requires expert treatment. Generally speaking, the bones should be placed in position and the injured parts bound with splints. To do this it is often necessary to fold and bind part of the wing. The leg is the part most commonly broken, and is comparatively easy to set. Splints are not necessary. Provide a long strip, say 6ft. or 7ft., of fine calico or muslin about 1in. wide, dip it in white of egg or starch. Let someone hold the bird firmly, and also the injured leg. Carefully place the bones (if compound fracture) in position, see that the foot is straight by comparing with the other one, then carefully and firmly bind round and round with the prepared muslin. Place the bird in a coop for a few days, and after that he can have liberty where no other birds can molest him. In about three weeks the bandage may be removed. The bird will limp for a few days, and soon, if skilfully performed, no signs of the operation will be visible. Toes may be treated in a similar manner. Fracture of the thigh requires the help of splints, which may be of cardboard or soft deal. After firmly placing in position, bind with starched muslin (wet, of course).

GAPES.—This affection of poultry is generally present among young birds, and is due to the irritation caused by a parasitic worm (*Sclerostoma syngamus*). The habits and history of the worm are well known to science, and those interested may gain further knowledge from any work on parasites of man and animals. The parasite increases with great rapidity, and soon affects all the young birds. It is conveyed in the food, and passes out with the droppings, so that absolute cleanliness and frequent applications of lime and insecticides are necessary. Enormous mortality is caused by gapes in some countries. The worm can be extracted from the windpipe by means of a feather or a loop of horse-hair; it is generally of a reddish color. The symptoms are continual gaping and gasping for breath; later on a nasal discharge is seen, and in time the lungs are affected, and inflammation and pneumonia may supervene. *Treatment.*—There are many methods in use, a common one is to insert a feather into the windpipe, and on its withdrawal worms are found attached. The feather may be medicated with tobacco water, kerosene, turpentine, eucalyptus, &c. The inhalation of lime dust, or the fumes of carbolic acid or eucalyptus oil are serviceable. *Method of fumigating.*—Make a box of the dimensions required for one or more birds. The box should be about 2ft. high, so as to admit of a false bottom about 6in. from the ground, and made of wire netting or narrow bars for the birds to stand upon. No cover is required beyond a piece of sacking. Have a small door at the bottom so that a piece of hot iron can be placed there, and on this pour from time to time a few drops of carbolic acid, turpentine, or eucalyptus. As the birds inhale the fumes they should be watched, and if overcome, must be given air by lifting the sacking cover. A fumigating box is simply made, and is of the greatest use for treating colds, roup, diphtheria, &c. A small tripod with kerosene lamp and tin dish is exceedingly handy where frequently required. Chlorine gas is a deadly foe to parasites. Place a teaspoonful of common salt in a saucer, sprinkle with a little black oxide of manganese, and pour a little sulphuric acid on the whole. Two minutes is sufficient and care must be exercised.

GASTRITIS.—This is inflammation of the stomach, and is caused by long-continued overfeeding and the use of spices and condiments. There is a loss of appetite and the bird mopes, breathes quickly, and in addition there is

frequent retching with thirst, constipation, ruffled plumage, rapid emaciation and prostration. Give soft mucilaginous cooked food. Give a grain each of opium and calomel in a pill; and rice water containing one grain of arsenite of copper to each quart. Feed sparingly.

GOUT.—This is not real gout, but is a swollen condition of the feet, due to congestion of the blood vessels consequent on a plethoric state of the system. Birds in confinement are frequent sufferers. *Treatment.*—House the birds in a warm, dry place; give a quarter of a teaspoonful of Epsom salts with the plain soft food, and after that give daily a pill containing $\frac{1}{2}$ grain of extract of colchicum. Rub the affected parts with eucalyptus oil. When better give the bird more room, where it can indulge in a little exercise and scratching.

INDIGESTION, OR DYSPEPSIA.—This is due to errors in feeding; also to the absence of green food or its equivalent. Proper food at regular intervals, and plenty of hard grit, with a teaspoonful of sulphate of magnesia to each pint of drinking water for a week, and then substituting Douglas mixture will generally effect a cure. Where green feed is scarce, the use of Epsom salts and Douglas mixture in the soft food at least once a week is excellent. Crushed charcoal is a splendid antiseptic and is eagerly eaten, especially by laying hens. A supply should always be available and under cover. Give a little at a time, because, if wet, it loses part of its absorbent powers. Many breeders mix some regularly with the soft food.

INFLAMMATION. —Of the Bowels	..	See Enteritis
“ Cloaca	..	“ Cloacitis
“ Crop	..	“ Crop, Inflammation of
“ Egg-passage	..	“ Egg-passage
“ Feet	..	“ Gout, or Bumble Foot
“ Liver	..	“ Liver, Inflammation of
“ Lungs	..	“ Lungs
“ Peritoneum	..	“ Peritonitis
“ Stomach	..	“ Gastritis
“ Throat	..	“ Diphtheria, Roup, &c.

LEG WEAKNESS.—This is due to insufficient bone-forming material, and is especially noticeable in overgrown young birds which have been unduly forced. If not attended to when the earliest symptoms appear the bird will be permanently affected and rendered valueless. An alteration in food is required, as the weight must be reduced. Give plenty of bonemeal in the soft food and add some Douglas mixture to the drinking water. Keep in a warm, dry house, and regularly rub the legs with eucalyptus (or any such substance) to promote counter-irritation and circulation. When sound stock is bred from and bonemeal added to the food after the chicks reach eight or ten weeks leg-weakness is very rare.

LICE.—See Vermin.

THE LIVER.—Atrophy, or wasting of the liver, is not uncommon among ill-fed poultry. *Post-mortem* examination shows a very small, pale liver. The accompanying symptoms are depression, drowsiness, lustreless plumage, sickness, bilious evacuations (black or bloodstained at the last), death being ushered in by stupor, with final convulsions. Except during the early stages treatment is of little avail. The use of Epsom salts—say a quarter teaspoonful—in the water used for mixing the soft food for the bird, and the addition to each quart of drinking water of ten drops of nitric acid, have proved effectual.

LIVER, CONGESTION OF, is more common during hot weather and among birds in close confinement. The symptoms are depression, irregular and bilious evacuations, and loss of appetite, and occasionally heat and enlargement at bottom of breastbone. *Treatment.*—Tincture of cascara, six drops daily in water, is an excellent remedy. Also, daily for four or five days, a pill containing

10 grains each of sulphate of magnesia and bi-carbonate of soda; afterwards add a little powdered gentian to the soft food and a few drops of nitro-hydrochloric acid to the drinking water. Give plain food only and ample range.

LIVER DISEASE (so called).—See Scrofula.

LIVER, ENLARGEMENT OF (or hypertrophy), is very common among overfed birds subjected to little exercise, and without green food and exposed to much heat. Imported birds often have enlarged livers, due to the long voyage.

INFLAMMATION OF LIVER is a frequent cause of death and is due to insufficient exercise, overfeeding, exposure to cold and damp, intense heat, or injuries. It is also associated with scrofula and tuberculosis. Among the symptoms are tenderness if pressure is applied, enlargement of abdomen, depression, bilious diarrhoea or dysentery, quickened breathing, rapid emaciation, yellow skin, thirst, loss of appetite. Not infrequently lameness is manifested in the right leg. *Treatment*.—Half a grain each of calomel and opium, repeated in six hours, and followed by a dose morning and night of ten grains of carbonate of potash. The diarrhoea may be checked by four to six drops of chlorodyne. Feed sparingly on boiled rice, or bread soaked in milk or lime water. Add a few spots of nitro-hydrochloric acid to the drinking water. It will be seen that these diseases are all preventable, and are due to bad management.

MANGE, OR SCABIES.—This is due to the presence of a small parasite (*Sarcoptes mutans*). This is not a common disease; but two cases were reported to me which were undoubtedly mange. The parts chiefly affected are the head, round the beak, and the feet—the latter are supposed to be the seat of the disease; the birds hold up their feet and peck vigorously, and thus the beak is infected. Small pimples are at first seen, and after rupture they are succeeded by flaky crusts like bran; the feathers are ruffled and easily detached. An excellent ointment is similar to that used for mange in dogs. Whale oil, 8ozs.; kerosene, 2ozs.; flower of sulphur, 4ozs.; oil of tar, 1oz.—shake well and rub in daily. Isolate all affected birds as the disease soon spreads. Should isolated patches refuse to yield to treatment, paint twice a day with strong tincture of iodine—this is most effectual. Be sure to thoroughly cleanse and disinfect the hands immediately after handling such birds, or in fact any diseased birds—carelessness may lead to disaster.

PERITONITIS.—Inflammation of the serous membrane which lines the abdomen and invests the viscera is a frequent cause of death in poultry. It is due to many things, and is caused by violence, wounds, bruises, &c.; also to the presence of blood, pus, or ruptured egg in abdomen or egg passage. The bird is very feverish, and the temperature frequently ranges from 107° to 110°; the sufferer is also restless, and the abdomen is very tender to the touch, full, and hot. As the malady increases the bird falls on one side, the legs are drawn up close to the body, the breathing is rapid. Very little can be done to afford relief. Pills containing a grain of opium may be administered twice a day, and will afford relief from pain. Milk and warm meat gravy, in equal parts, may be administered.

(To be continued.)

Notes.

The season at time of writing is remarkable, and those who have hatched early broods can congratulate themselves. I am pleased to say that I have a number of fine chicks from the recently imported Partridge Wyandottes and Old English Game, and am expecting more in a few weeks. I have devoted myself this season to the following breeds:—Minorcas, including some first-class birds bred from the grand pen secured by Mr. Maude, and which bred so

many winners last year. I have also other strains, including some fine hens. I have two large stud flocks of this breed. Old English Game will not be available for exhibition or distribution till later on. I find the hens good layers, the chicks hardy and quick growers, and doubtless the value of this premier table breed will soon be well recognised.

PARTRIDGE WYANDOTTES.—These birds excited most favorable comment in Victoria when they landed. I have only one pair, and the hen is a grand layer, and lays the largest Wyandotte egg I have seen. The chicks are very hardy, and soon grow into big ones. This will be a favorite farmers' fowl. They are remarkably quiet, and eat far less than any other breed.

GOLD-LACED WYANDOTTES.—I have a fine pen of these, including different strains; they are grand layers, small eaters, and the quality of flesh A1. I hear the breed is very popular in the other States.

WHITE WYANDOTTES, as I prophesied, are booming in Victoria and New South Wales, while in America they are great favorites; they are splendid layers and small eaters. The cockerels are beautiful for the table. I have added a first class American-bred pullet to the stud. The combination of English and American strains is the best possible. I had a letter from a friend in Victoria who bred and disposed of 1,000 odd Wyandottes last year, and intends breeding 1,500 this year, all being well. Minorcas are gaining in popularity everywhere; in fact on all sides and at big shows we see utility poultry and the best varieties away to the front.

I noticed a remark of the Gen. Secretary's about poultry experts not recommending *one breed* as the best. That is one reason of their being experts. They know that there is no best breed, but that at certain seasons or in certain localities, or for various purposes several breeds may be recommended. When a man knows or keeps one breed only, he may be relied upon to boom that one, but when a man knows them all and has kept most of them he is in a position to give reliable information, and may, if asked, recommend one breed for a definite locality or purpose.

COD LIVER OIL IN CALF-FEEDING.

Several years ago the late Thomas N. Grierson, previously manager of Hill River Station, later of Beefacres Farm, South Australia, and afterwards manager of Mort's Bodalla Estate, New South Wales, demonstrated the effective value of crude cod liver oil as a substitute for cream in feeding calves on separated milk. Now we have another proof in a series of tests conducted by the Yorkshire Experimental Station, Leeds, since 1899, when it was shown that whilst calves reared on whole milk weighed a little heavier than others fed on skimmed milk enriched with cod liver oil, yet the extra weight was produced at a cost three times greater, and that the extra cost was altogether out of proportion to the weight gained.

A later experiment last year was carried on with the object of again testing the value of cod liver oil, and also of ascertaining whether the oil might not with advantage be given, after weaning, to the calves that had been accustomed to it. Twelve calves, all about a week old, were purchased between March 19 and 24. They were fed with whole milk twice a day, the allowance per head to begin with being six pints per day. The milk was gradually increased until each calf, when about six weeks old, was receiving eight pints per day. Having reached this age they were weighed on April 28, and divided into two lots, one lot of four to be reared on whole milk and the remaining eight to have separated milk with a small quantity of cod liver oil gradually substituted for the whole milk on which, up to that time, they had been reared. On May

12, when the calves were eight weeks old, the eight ceased entirely to get whole milk, and from that date their diet consisted of separated milk and cod liver oil. On the same day the quantity of milk—either whole or separated—for each calf was increased to ten pints. The allowance of cod liver oil to each of the eight animals had now reached 2ozs. per day, and this quantity was maintained. On June 9 the whole milk for each of the four calves was increased to twelve pints per day, and a similar increase was made in the case of the eight receiving separated milk. This daily allowance of milk was continued until September 15, after which date a gradual reduction was made, and the calves were weaned on September 22. As regards trough food, all the calves on June 2 got their first allowance of a mixture of about 1lb. of linseed cake and bran, and as much hay as they cared to eat. The quantity of cake and bran was gradually increased until on September 22 each calf was getting about 4½ lbs. per day. It is further noted that the animals were not allowed out to graze.

The summarised conclusions are:—1. That the previous experiments are confirmed in showing that cod liver oil as a substitute for butter fat may be used with safety along with separated milk for rearing calves. 2. That it is a substitute to which calves soon get accustomed; in the use of which there is little labor involved; and, where a separator is kept, affords a cheap means of rearing calves. 3. From the experiment it seems advisable to continue to give the oil, at least for a time after weaning, along with the linseed and bran. 4. The oil used in the early stages of calf-rearing does not seem to have any detrimental influence on the flesh of the animals when slaughtered for meat.

FERMENTATION OF WINES.

PERSONAL OBSERVATIONS, WITH SPECIAL REFERENCE TO THE USE OF COOLING APPARATUS SUITABLE FOR SMALL AND AVERAGE CELLARS.

BY ARTHUR J. PERKINS, GOVERNMENT VITICULTURIST.

(Paper read before meeting of South Australian Vinegrowers on May 13.)

My main object to-day is to draw your attention to a simple method of keeping in check the rise in temperature of fermenting vats. My own observations go to prove its perfect efficiency, even in presence of most unfavorable conditions. I would, however, preface any reference to it by a brief examination of two points not unconnected with it—1st, the efficiency of the centre pumps attached to the false heads commonly in use in our cellars; 2nd, the efficiency of the surface coolers now generally adopted here. These two questions are, to a certain extent, mutually dependent one on the other, because under our present practice on the efficiency of the centre pump a large measure of the efficiency of the surface coolers depends.

I think that we may summarise the work that the centre pumps are called upon to accomplish in the following manner:—

(1) To produce evenness in the fermenting mass by thoroughly mixing up the different parts of the liquid.

2. To bring about uniformity of temperature throughout the vat.

3. To extract the maximum of coloring and extractive matters from the skins by causing the juice to repeatedly pass through them.

4. To aerate the fermenting mass when such aeration becomes necessary.

My observations lead me to believe that, excepting in the last case—that of aeration—the work done by these pumps is exceedingly unsatisfactory. So convinced have I become of this that, although centre pumps are fixed to all the

false heads in the Roseworthy cellars, I now make no further use of them. I think that it would be of interest during forthcoming vintages to ascertain whether others can confirm my views on the subject or not. Of course I recognise the great simplicity of manipulation of these pumps. It was this advantage that at first attracted me to them. I have come to the conclusion, however, that it does not make up for their other defects; and I much prefer the more laborious, but, in my opinion, eminently effective method of running out the liquid from the bottom of the vats and pumping it back over the skins.

Let me now explain on what are based my objections to these centre pumps. Everybody is, I presume, familiar with the extreme compactness of the cap whilst the must is in fermentation and the gas struggling to escape. In this condition it offers a considerable amount of resistance to the percolation of liquid, and I am led to believe that the momentary vacuum produced with every upward stroke of the pump is only felt within the immediate neighborhood of the centre pump. From this results the formation of what we may term the suction area of the pump, representing around it a circle not exceeding 2ft. in diameter. Through the skins below this area the liquid gradually works channels, and keeps passing through it over and over again, whilst the mass of the skins remains untouched.

That such is the case can readily be proved, and an account of the facts that definitely confirmed views that had long been simmering in my mind will open the door to those who may be anxious to carry conviction to their minds by actual experiment. I happened to be in the Coonawarra cellars during the opening of the 1901 vintage. As is frequently the case in this district, the weather was cold, and fermentation hung fire. I advised the manager, Mr. E. F. McBain, to run steam through his surface coolers, and mix up the must by working the centre pumps. Whilst the first vat was being treated in this manner, we watched the progress of the rise in temperature in the skins by means of a long-stem thermometer. As soon as the surface temperature reached 100° F., the centre pump was set going; if my memory serves me right, it was worked for nearly an hour. At this stage, although the temperature of the free liquid above and below the false head and of that portion of the skins within what I have termed the suction area of the pump was, approximately, 80° F., the temperature of the skins beyond the suction area still remained below 60° F., which was the initial temperature of the vat. These facts, to my mind, clearly demonstrate that the same liquid was being acted upon over and over again by the pump; that this liquid was only a fraction of the total quantity present in the vat; and that moreover it only passed through a very limited quantity of skins placed in the immediate neighborhood of the pump. I subsequently advised Mr. McBain not to use the centre pump for the next vat, but draw off from the bottom outlet and pump over the skins. In this vat results were most satisfactory, a uniform rise in temperature being noticeable throughout the skins; and, further, although in both vats the grapes were of the same variety—Shiraz, I believe—in the second one the juice, though not in fermentation, rapidly assumed a fair red color, whereas the first one retained practically its original color. This last feature tends to confirm the view that in the first vat, when the centre pump was in use, the heated juice had only passed through a limited amount of skins, and in consequence had not been able to dissolve much coloring matter.

From the above experiments I judged that the following propositions, unless otherwise disproved, must be allowed:—(1) That the centre pump is not a suitable contrivance for establishing uniformity of temperature and fermentation throughout the vat. (2) That when the centre pump is used regularly throughout fermentation, to the exclusion of drawing off from the bottom and pumping over the skins, a large amount of coloring matter which might otherwise have been taken up remains untouched.

This latter point is not of much importance when grapes naturally deeply colored, such as Shiraz, are fermented; but this is not the case with others, such as Mataro. I am convinced that with the latter we should obtain a far more deeply colored wine, and consequently a more full-bodied wine, if we set aside the centre pumps altogether, and throughout the course of fermentation, twice every day and for the space of an hour at a time, we drew off the liquid from the bottom and pumped it over the skins. In small cellars the pumps would have to be worked by hand, but in large ones there is no reason why the pumps should not be connected with the main shafting that drives the elevators and crushers, and thus worked automatically.

I have already recognised that these centre pumps facilitate the aeration of the must. So far as the liquid acted upon them is concerned this is true enough; but what of the bulk that remains imprisoned in the skins and often needs it most, and, from what we have already seen, remains practically untouched? And, moreover, this aeration is a thing that can readily be abused. This is a subject upon which I cannot at present enter into details; but I think that it is now admitted by all that all the aeration that is necessary should, as much as possible, be given to the must before the start of fermentation, but that subsequently the must should only be aerated when circumstances render it absolutely necessary. Now if you rely exclusively on your centre pumps for stirring up your must, every stroke of the pump causes the absorption of a more or less considerable quantity of oxygen; there is therefore danger of over aeration. If, on the contrary, you pump over your must from the bottom outlet this can easily be avoided by fitting on to the bottom outlet a short bit of hose that is kept well plunged in the outflowing liquid, and by keeping the delivery hose of the pump well immersed within the free surface liquid.

Now as to these surface coolers. It would be useless for me to deny them some measure of usefulness. It is quite evident that a stream of water, however small, entering a vat at a low temperature, and issuing from it at the same temperature as the vat, must relieve the latter of some portion of heat. Further, the success of the vintages of the last few years is, in many cellars, attributed mainly to their aid. I am afraid, however, that other factors as well have latterly joined hands to make our vintages a success, and that should they, as is probable, desert us, we shall be exposed to rude awakenings, did we place unlimited confidence in these surface coolers. For instance, it must be recognised that during the last four or five years we have generally been favored with exceptionally good vintage weather; but this can hardly be expected to continue indefinitely. Nor, again, have we been making wines quite as full as in those years when sweet acid wines occasionally almost equalled the bulk of sound wines. The cry from London, however, is now for stronger and stronger wines; and it seems likely, at least for some years to come, that we shall be called upon to make wines of even fuller type than those we have hitherto made. It is then that these surface coolers must stand their trial, especially if unfavorable weather conditions should be more common than has latterly been the case.

Before examining the somewhat debatable question of the general efficiency of these surface coolers, it may be pointed out, as a consequence of what has already been said, that much of what efficiency they may possess disappears if they are used conjointly with a centre pump. The skins are pre eminently bad conductors of heat, and therefore show little tendency to lose heat when in contact with slightly cooler liquid. I have often had occasion to watch this phenomenon. In one instance I recollect that in one spot of a vat the temperature of the skins for some unknown reason was 85° F., whereas, within a foot of this spot, and throughout the rest of the skins, the temperature was only 60° F. This difference of twenty-five degrees was still observable twelve hours after the first observation. In fact at no time is it ever possible to

register quite uniform temperatures throughout the body of the skins. Here it may be pointed out that it is the exclusive use of an ordinary size thermometer that has deluded many into the belief that surface coolers were maintaining a uniformly low temperature throughout their vats. Dr. Angove was the first to draw my attention to this fact, and, following his example, I purchased a thermometer with a stem 3ft. long, and wherever I have used it I have found temperatures far above those a short thermometer would ever lead one to suspect. In fact, in one cellar I was challenged to show that in any tank in which surface coolers and centre pumps were regularly used temperatures above 85° F. could be registered. By the aid of my long thermometer I was able to prove it on the first tank examined. I asked my challenger first to take the temperature in the ordinary way. This he found to be below 85°. I then plunged the long thermometer in the skins, and the mercury soon rose above 100° F.

From such considerations I am led to infer that the efficiency of surface coolers would be raised if centre pumps were discarded and the liquid pumped over from time to time after drawing it out from the bottom outlet.

Personally, however, I very much doubt whether even under the most favorable conditions these surface coolers will prove really efficient with very dense musts and unfavorable weather. My scepticism arises out of a calculation of the rate of flow of water necessary to secure perfect results. I may summarise the matter as follows:

Let us assume that we have at our disposal water that can be brought to the tanks at a temperature of 65° F., and in summer I very much doubt whether lower temperatures can be secured. Can this water, by circulating through the surface coolers generally in use, keep a must at 80° F. which would otherwise, weather favoring, reach 100° F. in twelve hours, if not less? This means that the amount of heat generated during this time would, after deduction of losses by radiation and other sources, be equivalent to a rise in temperature of 20° F., distributed over the whole mass of matter in the fermenting vat. We cannot for an instant suppose that it is the liquid alone that we have to cool; the skins contain just as much heat, and, what is more, retain it far more tenaciously. Putting the case in the most favorable light possible, we may assume that every pound of water circulating through the coolers takes away a given quantity of heat from a pound of the heated matter in the vat. Assuming that the water which enters at 65° issues from the coolers at 80° F.—the temperature at which it is sought to maintain the vat—the amount of heat removed by every pound of water may be looked upon as equivalent to a rise in temperature of 15° F. If we further suppose that the vat to be cooled contains 5 tons of fermenting matter, corresponding only to 650galls. of wine, the amount of heat gained by this mass during the twelve hours would be represented by $2240 \times 5 \times 20 = 224,000^\circ \text{ F.}$

This sum divided by fifteen—the number of degrees that each pound of water is supposed to gain—would give the number of pounds of water that would have to circulate through these coolers during the twelve hours, $\frac{224,000}{15} = 14,933\text{lbs.}$ of water, or 1,493galls. This would represent a flow of 2galls. a minute for a relatively small tank. Such a rate of flow is never obtained in ordinary coolers, and, were it obtained, the surface of contact would have to be considerably increased before the water could have time to be sufficiently heated to issue at 80°. Further, the amount of water required for cooling purposes would be enormous under such circumstances—a 100,000galls. vintage would call for from one to two million gallons of water!

It is on such grounds that rest my doubts as to the efficacy of these surface coolers in troublous times. I trust that in those cellars in which faith is still placed in them the matter will be thoroughly investigated during coming vintages.

But apart from such considerations, even if the action of these surface coolers were irreproachable, there exist many cellars in which large quantities of water at a suitable temperature is not obtainable. It is to such cellars, I imagine, that the cooler to which I am about to refer may prove of interest.

It is now four or five years that I have been endeavoring to solve the difficulty of checking the rise in temperature of vats in cellars ill provided with cool water. During this period I have had occasion to try and test various forms of simple coolers, and have finally come to the conclusion that the simplest and most efficient is the one recommended by an old fellow student of mine, Mr. A. P. Hayne, in charge of the Californian Viticultural Station. I had exceptional opportunities of testing its value during the past vintage, having both extremely dense musts and occasionally very unfavorable weather; and, in spite of the crudeness of the model upon which I had to work, results obtained were of a most satisfactory character.

In principle the cooler consists of a double set of copper pipes, superposed one above the other in a vertical plane, through which the must circulates; on to these pipes is blown by means of a centrifugal air fan water issuing in an extremely fine state of division from a battery of ordinary spray nozzles. In Mr. Hayne's apparatus the whole is enclosed within canvas sleeves. I found, however, that better results were obtainable when the apparatus was enclosed in a box made of sheet iron. The pipes are short, 3ft. to 4ft. in length, and 5½ in. x 1½ in. in breadth and depth; they fit into a common metal head, closed by a single plate with a sheet of rubber as washer. In order to avoid loss of spray, and consequently of cooling power, the pipes are placed 1 in. apart, and inclined at an angle of 30°, opposing pipes of either column forming an inverted V.

As I have already said, the cooler I used during the past vintage was very far from perfect in construction; nevertheless it gave results that were exceedingly satisfactory, and which I hope will be improved upon during the coming vintage. The fact that I was able to run out dry a Shiraz must testing about 1120 density, with strong north winds and the temperature in the shade for several days in succession above 100° F., is, I think, a sufficient proof of its efficiency. Without the aid of the cooler I feel certain the wine would have been lost.

This cooler is comparatively inexpensive, and involves the use of but little water, part of it being used over and over again; it further presents the advantage of working at its best when the atmosphere is at its driest and hottest. It should, therefore, commend itself to our small cellars; the pumping of the must may be done by hand or by connection with the shafting driving the crushers. I am prepared at any time to give details relating to its construction.

AUSTRALIA AS AN AUXILIARY TO BORDEAUX.

The State Agent for South Australia has forwarded copy of *Diplomatic and Consular Report* No. 2612 (France) for year 1902, by Mr. Consul Hearne, in which he refers to the opinions of M. Bellot de Minières, who is a great believer in the future of Australia as a wine-producing country; but he also thinks that if the Australians imitate the Russians by planting vines grafted on American stocks, and also by treating them with lime and copper washes, they will succeed in producing, as the Russians have done, wines which they can neither drink nor sell. He believes that there is no country that can produce such claret as France, but if any country can ever approach it that country is Australia, if only the vines are chosen, planted, and treated as they are on the best vineyards of the Gironde. He believes that stony, gravelly soil can be

found there, acted on by radiatory points of solar incidence similar to that found in the Gironde, and that in time, with care, Australian wines will be grown resembling greatly in bouquet and flavor the wines of the Gironde.

M. Bellot de Minières holds that its great interest in wine has prevented Bordeaux becoming more important as a seaport than Antwerp, Liverpool, and Hamburg. Situated on the banks of one of the finest rivers in Europe, with such affluents as the Dordogne, Tarn, and Lot, in connection with the canals of the Midi and Rhone, and at the same time the terminus of an enormous railway system, all of them opening up communication between the Atlantic and the Mediterranean, from the Pyrenees to the Alps, Bordeaux should be the most important port in France; but for ages Bordeaux has had no other thought but the wine trade, which has been so flourishing that it enjoyed prosperity without any other effort. The merchants bought wine on the spot, sent out their samples, and the post brought back the orders by return. They came flowing in, and the wine was resold wholesale with a gain of 15 per cent. on the gross outlay. The merchant with a private connection gained 25 per cent. or 30 per cent., and the Gironde—and especially Bordeaux—was a land flowing with milk and honey. This prosperity, which called forth neither effort nor energy, brought with it an indifference, a kind of physical and intellectual torpor, which first of all let the maritime commerce escape, followed by the monopoly of the wine trade which Bordeaux enjoyed. The wine deteriorated, and commerce, which had but that one string to its bow, disappeared, resulting in the panic of 1899 and the present stagnation.

M. Bellot de Minières considers that the commercial system of Bordeaux must be reawakened, that it must seize the idea of great lines of steamers, of great commercial enterprises, and it must be welded to the British-Colonial Commonwealth of Australia and the Cape. The prosperity of those far-distant countries must be brought to nourish Bordeaux, and then the prosperity of the latter will increase that of the younger lands. Without in the least prejudicing the vineyards of the Gironde, their wine can be mixed with that of Australia and the Cape. Thus, the Gironde, like the rest of France, having gone in for grafting vines and their treatment with lime and copper, the wine has lost its properties of days now gone; consequently France, and especially Bordeaux, is bound to get from warmer lands wines rich in color and alcoholic strength to fortify its own wines, which, previous to the introduction of graftings, were used for that purpose. The south of France has imported largely from Spain, Portugal, and Dalmatia. Why not, then, bring these from Australia, which, seeing the immense zone she possesses fit for wine-growing, will provide just as good wine if they only know how to set about it, as Spain or Dalmatia? Some may say that the distance is an obstacle, but if any one had stated fifty years ago that Californian or Australian wheat would compete with French wheat, he would have been considered mad, and yet this has come to pass.

Then, again, there is Australian timber. At the Paris Exhibition, last year, Australia exhibited a phenomenal collection of pine wood for building, as well as for cabinet and joiner's work. For the former use this timber can compete on equal terms with the pine wood of Scandinavia, while it eclipses it entirely for the latter use. This is another source of industry which should unite Australia with Bordeaux, which port commands the whole central basin of France, Languedoc, and Provence, and could successfully compete with Havre or Antwerp for the Swiss trade, and, by differential tariff on the Orleans railway, could place on board ship in the Garonne Parisian manufactures at every bit as low a rate as the Western Railway at Havre. Consequently, to restore Bordeaux to its former prosperity, what are required are men of business capacity and energy who can grasp and bring to fruition this great economic question, and open up a growing communication between Bordeaux and the greatest colonies of the British Empire.

[These ideas should excite interest in the minds of Australian readers, even if no action should be taken by the Bordelais to realise the position foreshadowed by M. Bellot de Minières, who, however, promulgates an idea that the result of grafting French vines upon American phylloxera-resistant stocks has slowly resulted in the effects that would be caused by hybridisation and consequent deterioration in the quality of the fruit, which deterioration has been further increased, so he argues, by the use of lime and copper sprays (Bordeaux mixture). To these two contentions there are few, if any, supporters, but there may be, after all, strong ground for careful observation and inquiry.—Ed.]

USE OF FERTILISERS IN SOUTH AUSTRALIA.

BY W. L. SUMMERS, INSPECTOR OF FERTILISERS.

Seeding operations being practically over for the present wheat season, I am now able to furnish some interesting information concerning the use of commercial fertilisers in this State so far as applied to cereal crops.

With a view to furnishing figures that may be confidently accepted as reliable, I have, during the past few years, kept careful records of importations, exports, &c., and the principal local manufacturers have been good enough to furnish me with particulars which allow of the local output being determined.

In arriving at the quantities used, the imports and local output from December 1 to May 31 are taken into account; any manure arriving after the middle of May does not go into consumption to any extent.

The actual imports were—

	Tons.
Superphosphate	29,500
Thomas phosphate	1,750
Bonedust	550
Total	31,800

After making due allowance for imported stocks left on hand, or used for manufacturing purposes, I estimate that of the above total over 27,000 tons have gone into direct consumption.

The local production was—

	Tons.
Mineral guano and bone supers.	10,000
Bonedust and other manures	1,250
Total	11,250

A considerable quantity of the local output of bone-super., bonedust, and similar manures is used by the market gardeners, fruitgrowers, nurserymen, and others; the allowance of 750 tons made for this will, however, be more than ample.

Taking the above figures as fairly accurate, the following shows the financial aspect of the question :—

Imported fertilisers, 27,000 tons, cost	£117,700
Local output, 10,500 tons, cost	46,000
Total, 37,500 tons, cost	£163,700

The cost here is the actual cost on boat or truck to the farmer, and is ascertained from the cash prices for the different kinds of fertilisers, making the total of 37,500 tons. In addition the farmer has to pay rail, road, or boat freight, and putting this at the low average of 5s. per ton, we have an outlay on manures alone of £178,000 for one season's work.

The following table gives the estimated tonnage of commercial fertilisers used for the South Australian wheat crop for the years mentioned :—

Year.	Local Production.	Imports.	Total.
	Tons.	Tons.	Tons.
1899.....	4,000	12,500	16,500
1900.....	3,400	21,200	24,600
1901.....	5,000	26,400	31,400
1902.....	10,500	27,000	37,500

It will be seen that while the local output has doubled during the past season owing to the manufacture of mineral super. by the Adelaide Chemical Works Co. and the Wallaroo Phosphate Co., the imports have increased but little. This is due mainly to one cause, *i.e.*, the late arrival of a shipment of over 2,000 tons, most of which will have to be carried over or exported, as owing to the unfavorable season there will be little demand now for it.

In arriving at a fair estimate of the area of crop manured with commercial fertilisers a difficulty presents itself. We have no records from which this can be ascertained, and in the past I have, in order to be well under the mark, placed it at twenty acres to the ton of manure. It is well known, however, that few farmers use 1 cwt. per acre, while very much of the area manured receives less than 70lbs. I have during the last year or more made careful inquiries in a number of districts, and am confident that the average quantity used does not exceed 84lbs. per acre. Taking it at 100lbs. per acre, however, in order to be under rather than over the mark, the area manured this year will be fully 840,000 acres. If we accept 84lbs. per acre as a fair average, the figures would be 1,000,000 acres.

What does this represent to South Australia? In addition to the expenditure of £173,000 for manure there is the outlay on seed and fertiliser drills (which last year was fully £30,000), binders, &c. There is also the handling of all this manure, the labor involved in putting up new implements, rail freights, &c., on same, all of which has to be paid by the farmer from his increased crops. Then there is this increase in the crop, which to be profitable must equal nearly 80bush. for every ton of manure used. Taken altogether it will be readily seen that the advance made in farming of late years in this one direction has been of immense value to the whole State.

In carrying out my duties as Inspector of Fertilisers I have made every effort to keep a strict check on all fertilisers sold in this State, and to ensure that the spirit of the Act is not evaded. On the whole I am pleased to say there is very little to find fault with. There have been some small discrepancies in the results of analyses of a few samples of local make as compared with the guarantees, but as these have not worked to the injury of the purchaser no proceedings have been taken by the department. During the six months I have taken samples of thirty-seven shipments of imported manures; this is less than last season and is due to the fact that the shipments averaged considerably larger than usual. During the same period twenty-six samples of local manufacture have been tested. The results have been published from time to time in the *Journal of Agriculture* and farmers are thus enabled to see whether the particular brands are what they were guaranteed to be.

The Fertilisers Act requires all brands to be registered, and the guarantee to be stated on the registration form. It is gratifying to know that the net cost of the administration of the Act is only £85, a small sum compared with the magnitude of the interests involved.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of May, 1902:—

Adelaide	1·07	Manoora	1·14	Macclesfield	1·63
Hawker	0·07	Hoyleton	0·94	Meadows	1·60
Cradock	0·07	Balaklava	0·76	Strathalbyn	0·98
Wilson	0·12	Port Wakefield	1·44	Callington	0·64
Gordon	0·10	Saddleworth	0·90	Langhorne's Bridge..	0·82
Quorn	0·15	Marrabel	0·71	Milang	1·25
Port Augusta	—	Riverton	0·93	Wallaroo	0·35
Port Germein	0·52	Tarlee	0·81	Kadina	0·49
Port Pirie	0·40	Stockport	0·66	Moonta	0·55
Crystal Brook	0·31	Hamley Bridge	0·51	Green's Plains	0·48
Port Broughton	0·47	Kapunda	0·59	Maitland	0·78
Bute	0·63	Freeling	0·50	Ardrossan	0·68
Hammond	0·37	Stockwell	0·54	Port Victoria	0·92
Bruce	0·03	Nuriootpa	0·75	Curramulka	1·18
Wilmington	0·36	Angaston	0·61	Minlaton	0·69
Melrose	0·66	Tanunda	0·84	Stansbury	1·00
Booleroo Centre	0·22	Lyndoch	0·53	Warooka	1·13
Wirrabara	0·68	Mallala	0·77	Yorketown	0·77
Appila	0·24	Roseworthy	0·64	Edithburgh	1·02
Laura	0·20	Gawler	0·77	Fowler's Bay	1·19
Caltowie	0·30	Smithfield	0·82	Streaky Bay	0·77
Jamestown	0·28	Two Wells	0·77	Port Elliot	0·83
Gladstone	0·27	Virginia	0·87	Port Lincoln	1·27
Georgetown	0·19	Salisbury	0·75	Cowell	0·49
Narridy	0·36	Teatree Gully	1·20	Queenscliffe	0·89
Redhill	0·43	Magill	1·31	Port Elliot	2·17
Koolunga	0·17	Mitcham	1·25	Goolwa	1·04
Carrieton	0·26	Crafers	2·70	Meningie	1·60
Eurelia	0·37	Clarendon	2·58	Kingston	1·05
Johnburgh	0·08	Morphett Vale	1·40	Robe	0·99
Orroroo	0·04	Noarlunga	0·84	Beachport	1·20
Black Rock	0·04	Willunga	1·01	Coonalpyn	1·26
Petersburg	0·13	Aldinga	1·04	Bordertown	1·01
Yongala	0·15	Normanville	1·41	Wolseley	0·83
Terowie	0·14	Yankalilla	1·64	Frances	0·75
Yarcowie	0·26	Eudunda	0·21	Naracoorte	0·80
Hallett	0·81	Truro	0·51	Lucindale	0·90
Mount Bryan	0·68	Mount Pleasant	0·86	Penola	0·98
Burra	1·07	Blumberg	0·98	Millicent	1·23
Snowtown	0·46	Gumeracha	1·23	Mount Gambier	1·01
Brinkworth	0·26	Lobethal	1·24	Wellington	0·78
Blyth	0·62	Woodside	1·28	Murray Bridge	0·52
Clare	0·95	Hahndorf	1·67	Mannum	0·46
Mintaro Central	0·82	Nairne	1·34	Morgan	0·10
Watervale	1·64	Mount Barker	1·64	Overland Corner	0·21
Auburn	1·22	Echunga	1·91	Renmark	0·19

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Company report :—

June 1, 1902.

But for a heavy thunderstorm during its closing hours, the month of May this year would have been almost rainless, and we think yet it will work out one of the driest on record. The weather continued clear and almost summery in its warmth, but unusually free from frosts, which gave feed, especially in sheltered spots, a chance to grow, so that though short, in many places there is better grass than at this time last year; but a good subsoil soaking is badly wanted. These remarks apply more especially to the southern and middle districts, the outside northern agricultural and the pastoral country being still held in the relentless grip of the drought that has relaxed but seldom and only for very brief periods in some odd places during the past seven or eight years. In the absence of rain farmers have been seeding their wheat in clouds of dust and unable to put the plough into many of the stiff lands, so that rather a poor start has been made towards the coming wheat crop, though in the past some of our

heaviest yields have followed seasons such as this, when the rains have come late but fallen in such quantities and times as to be of the most service; these conditions more than the number of inches of rain falling usually deciding the fate of wheat yields in South Australia.

Business in town and country has been quiet, but the apparent end of the struggle in South Africa having been reached, the declaration of peace it is expected will result in recovery of the metal markets, even if not at once establishing general prosperity. This is causing a spirit of hopefulness in South Australia, although climatic conditions are just now so very unfavorable for most of our staple producing interests. Slow progress is being made on the Taroocla goldfields, and but little signs of the prognosticated revival there.

European markets in breadstuffs have been very quiet during most of the month. In wheat a slight but only temporary activity showing in London about ten days ago, during which some half dozen Australian cargoes were quitted at 30s. per quarter, c.i.f., but prices have since declined, and re-sales of some have been made at 29s. 6d., which may be taken as to-day's value. Crop prospects both in Europe and America may be reckoned as favorable, by the easing in value that is showing, in face of the weekly decrease in visible supplies. In Melbourne the market has been fairly active, but is dull and declining, speculators being somewhat anxious to dispose of their buying contracts, which are now dropping in; 4s. 3d. per bushel is nominally quoted there, but at moment is unobtainable. Sydney is duller than for some time past, though the up country demand for inferior wheat for stock feeding is causing this grade to sell relatively above f.a.q. At Port Adelaide price went above 4s. 1d., but has again receded, and trade is exceedingly lifeless, sellers predominating both in wheat and flour. Millers' offal had good business, but growth of feed, though sparse, has caused demand to ease off somewhat; the price of bran and pollard slightly dropping in sympathy. Although local needs in forage lines have lessened, demand for chaff from Sydney has caused this to further improve, whilst feeding grains are also firmer in sympathy with markets in the eastern States.

The potato market is drawing its supplies increasingly from Victoria and Tasmania, locals here being nearly finished, only a few hundred tons left in the Gambier district. The firmness noticeable at the beginning of May became intensified, a rise in quotations of another 30s. per ton showing, but this proving relatively higher than imported values, local price eased back about 10s., making present quotations £1 a ton above rates ruling a month ago. The city trade for onions is being supplied by well kept samples of locally grown, which are coming in in sufficient quantities to fill market requirements. Moderate stocks are still held at Mount Gambier, but quotations there being relatively above city prices, Gambiers are chiefly supplying the country trade.

The relatively high prices ruling for most dairy produce has very materially lessened its consumption, the thrifty housewife making honey, jam, and other preserves take the place of butter, for which the retail price goes as high as 2s. per lb. Although lessened quantities, however, are being used the markets have been very active, for the reason that the supply has been short even of trade wants. A large proportion of that now being marketed is from New Zealand and Victoria, and values are being controlled chiefly by Melbourne rates. Unusually heavy deliveries of eggs have been coming in from the country, but, protected by the federal duty of 6d. per dozen, the strong inter-state demand has kept trade active at advancing rates until a few days ago, when values slightly eased. During June fluctuations may be expected, but the seasonable fall is hardly likely to be experienced for a month or more yet. A heavy turnover has been doing in cheese and bacon, but excessive importations of former, principally from New Zealand, has sent values back slightly, whilst fair supplies of pigs at the livestock market has caused bacon curers to slightly lower their quotations. Heavy business done in honey, for which price has slightly advanced; beeswax very saleable; almonds have been selling freely.

In dressed poultry and carcass meat, at each Friday's sale, increasing quantities have been submitted and sold at satisfactory rates. In live poultry the supply has been abnormally heavy, but a brisk demand, both local and for export, has readily absorbed all offering, so that values have almost recovered the drop that occurred a couple of months ago.

MARKET QUOTATIONS OF THE DAY.

Wheat.—Port Adelaide—Shipping parcels, f.a.q., 4s., f.o.b.; farmers' lots, 3s. 11d. on trucks, per bushel of 60lbs.

Flour.—City brands, £9 to £9 5s.; country, £8 15s. to £9 per ton of 2,000lbs.

Bran.—1s. 2d. to 1s. 2½d.; pollard, 1s. 3d. to 1s. 3½d. per bushel of 20lbs.

Oats.—Local Algerian and dun, 3s. to 3s. 3d.; prime stout feeding, white, 3s. 4d. to 3s. 7d. per bushel of 40lbs.

Barley.—Malting, 4s. 3d. to 4s. 6d.; Cape, 3s. to 3s. 3d. per bushel of 50lbs.

Chaff.—£4 to £4 5s. per ton of 2,240lbs., bags in, dumped, f.o.b., Port Adelaide.

Potatoes.—Tasmanian, £5 15s. to £6 5s.; Mount Gambiers, £5 5s. to £5 10s. per 2,240lbs.

Onions.—Local Spanish, £7 to £7 10s.; Mount Gambiers, £7 10s. to £8 per 2,240lbs.

Butter.—Creamery and factory prints, 1s. 6d. to 1s. 8d.; private separator, 1s. 4d. to 1s. 5d.; best dairy and well-graded store, 1s. 1d. to 1s. 3d.
 Cheese.—South Australian factory, 7d. to 8d.; New Zealand, 8½d. per pound.
 Bacon.—Factory-cured sides, 7½d. to 7¾d.; farm lots, 6d. to 7d. per pound.
 Hams.—South Australian factory, 8d. to 9d. per pound.
 Eggs.—Loose, 1s. 3½d.; in casks, f.o.b., 1s. 5d. per dozen.
 Lard.—In bladders, 8d.; tins, 7½d. per pound.
 Honey.—3½d. for best extracted in 60lb. tins; beeswax, 1s. 1d. per pound.
 Almonds.—Softshells, 5½d.; kernels, 10d. per pound.
 Dressed poultry.—Turkeys, 6½d. to 7d. per lb.; fowls, 1s. 5d. to 1s. 8d. each.
 Carcass Meat.—Bright shop porkers, 5d. to 5½d.; good baconers and medium porkers, 4½d. to 5d.; heavy weights and rough sorts, 3½d. to 4d.; prime veal, 4½d. to 5½d.; medium carcasses, 2½d. to 3d.
 Live poultry.—Fine table roosters, 1s. 8d. to 2s. 2d. each; good hens and fair cockerels, 1s. 3d. to 1s. 7d.; small and light birds, 1s. 1d. to 1s. 2d.; ducks, 1s. 8d. to 2s. 3d.; geese, 2s. 6d. to 3s. 6d.; pigeons, 4d.; turkeys, 4½d. to 6d. per pound live weight for fair to good table birds.
 Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, flour, and forage for export are f.o.b. prices at Port Adelaide. Dairy products are city auction mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese.

MISCELLANEOUS NOTES.

TO PICKLE ONIONS.—Peel some small silver onions, and put them into a pan of boiling water; when they look clear, take them out with a ladle, place them on a folded cloth, and when dry put them into a jar, and cover them with hot spiced vinegar. When quite cold bung them down and cover with stiff paper wetted with white of egg or milk.

CURING BACON.—For 112lbs. meat: Six pounds of salt, 4ozs. pulverised saltpetre, 2lbs. brown sugar, mix all together. Rub both sides of the meat with the mixture; place in a wooden tray to hold the liquid that will be produced; turn and rub once daily seven times; then turn and rub every second day for fourteen to twenty-four days, according to size of sides. Hang up to dry. Then cure in cold smoke.

WATERING HORSES.—The danger of watering horses after feeding was well shown in an experiment carried out some years ago on the Continent, where a number of worn-out horses were purposely killed for dissection, with the object of determining the effects of giving water shortly after the animals had consumed full feeds of grain. As might have been expected, a large quantity of the undigested grain which the animals consumed a short time previously was found to have been carried a long way into the intestinal track, fully 20ft. from the stomach, and though it had been there for only a short time, there were indications that it had already commenced to set up an inflammation of the mucous membrane, or the delicate covering of the intestines.

SOWS EATING THEIR YOUNG.—If a sow is inclined to eat her pigs when farrowing it denotes a bad condition of the system, probably caused by improper feeding during the period of gestation. It usually occurs when the sow has been fed largely on corn or other heating food. If sows have been fed on shorts, middlings, or ground oats, and have had a run on grass, there will be little danger of their eating their pigs. The unnatural appetite is caused by a feverish condition of the system, and when a pig has farrowed there is a strong desire to devour it at once. About the only thing that can be done is to take the pigs away as fast as they come, and keep them away till the sow is all through farrowing, and then carefully put them with her. Sometimes a feed of meat will satisfy the sow.

CENTRAL AGRICULTURAL BUREAU.

MONDAY, MAY 19, 1902.

Present—Messrs. F. Krichauff (chair), H. Kelly, R. Homburg, M.P., Thos. Hardy, R. Marshall, T. B. Robson, W. C. Grasby, Geo. Quinn, Sir Samuel Davenport, W. F. Snow, and A. Molineux (Secretary).

The Future of the Bureau.

The Chairman stated that the Minister of Agriculture had informed him that morning that it was intended to ask the members to send in their resignations, as he proposed, in place of the Central Bureau, the Council of the Agricultural College, and the Dairy Board, to have one small representative Board to advise the Minister. Under these circumstances it was a question as to whether they should go on with the business of the meeting.

Mr. HOMBURG moved—"That at its rising this meeting stand adjourned to a date to be fixed, and that in the meantime the Chairman interview the Hon. Minister of Agriculture and ascertain more definitely what his intentions were in respect to this matter." They would all regret that after fourteen years' work the Central Bureau should cease to exist, but they were helpless in the matter, and it would be folly to undertake any new business.

Mr. GRASBY seconded. He felt sure the Minister had the best interest of the State at heart in his proposals, and believed the change would prove beneficial.

The motion was carried unanimously.

Finances.

Mr. KELLY said that the financial position of the Bureau demanded attention. From a start on £150 per annum the expenditure had increased, until last year it amounted to over £2,000, and was still increasing. He was sure that such a heavy expenditure was bound to crush the Bureau. If the control of the finances had not been taken out of the hands of the financial committee of the Bureau this great increase of expenditure would not have been incurred. They should show the Minister that they desired the work in connection with the Bureau to be done as economically as possible, and he moved "That the Minister be informed that, in the opinion of the members, the work of the Board could be carried on at a considerable reduction in the expenditure."

Mr. HOMBURG seconded, and expressed surprise at the large expenditure. It was understood that when the Bureau was started the expenditure was to be kept within £150. The Bureau was started on the distinct understanding that the services of the Secretary and members were to be gratuitous. He thought they should be able to reduce the expenditure considerably.

Mr. MOLINEUX said they must remember that at the start they had only a few Branches, they published nothing, and had very little correspondence on work in connection with the public. As the Branches increased the expenses increased, and so did the work. He was pressed to take the position of Secretary, and did so for a nominal payment, carrying on his private business at the same time. As the Bureau grew the work grew, and he had either to relinquish his position or give up his private work, and, at the request of the members and the Minister, he did the latter at considerable pecuniary sacrifice. It was absurd to expect to run the Bureau with 109 country Branches on the sum that sufficed at the start, or to expect the Secretary to give the whole of his time gratuitously. The amount of £2,000 mentioned by Mr. Kelly included items that did not properly come under the Bureau expenditure. There was £900 for printing the official journal for the Department of Agriculture, £150

for railway passes for delegates to Congress, which was merely a transfer from one pocket to another, and the salaries of the officers, who devoted only a portion of their time to what was really Bureau work. As to the increase in expenditure of late years, apart from the *Journal*, the Bureau vote for expenses had been actually reduced, notwithstanding that the Branches had increased in numbers. We have now 109 Branches, and our contingencies expenditure would amount to £300, whereas in June, 1895, we had eighty-five Branches, and spent for the same purpose £400. In no other part of Australia was more effective work being accomplished at so small cost.

After further discussion the motion was carried.

Codlin Moth.

Mr. GRASBY dealt at considerable length with Mr. Quinn's remarks at the previous meeting of the Bureau. He read extracts from a number of reports which he contended proved the correctness of his assertions that he had "strenuously opposed the adoption of the regulations," and that "the Central Agricultural Bureau is not in any way responsible either for the Act or the regulations, or for the administration of the Act."

Mr. QUINN, in reply, said the responsibility of the Bureau for the Act or its administration was not in question. The Bureau had nothing to do with the administration, but the official minutes proved, without question, that inasmuch as drafts of proposed regulations had on several occasions been submitted by the Minister of Agriculture for consideration, and the alterations and recommendations which had been made by the Bureau had been incorporated into the regulations, the Bureau was in a large measure responsible for them.

Olives and Olive Oil.

Mr. HARDY reported that he had forwarded to the School of Mines and Industries samples of four different kinds of olives. One of these was a seedling of his which he had been growing for many years. It was a good bearer, with a large berry, and easily gathered; it contained a high percentage of oil, and was a good variety for pickling. The following were the results of the analyses referred to:—

Hardy's Mammoth, large berry, 27·4 per cent. oil; imported olive from Frontinia, small berry, 24·3 per cent. oil; Boquettier, from gaol plantation, 14·7 per cent. oil; small seedling from Parkside, 14·7 per cent. oil.

The marked difference in the percentages of oil in the different berries showed the possibilities of increasing our yields of olive oil, and it was a question whether it would not pay to graft over all the seedling trees with the best variety. Each tree would need to be tested, and this meant a greater expense than he was prepared for. He thought that analyses of soils, fruits, etc., of commercial importance should be conducted free, or at greatly reduced cost. It had cost him £3 to test these four kinds of olives.

Apple Mussel Scale.

Mr. QUINN stated that some remarks he made at previous meeting about the presence of mussel scale on Tasmanian apples had been misinterpreted. A number of growers from Norton's Summit and surrounding districts had got up a memorial protesting against what they termed the introduction of a new pest which was far more dangerous than the codlin moth. As a matter of fact, all the apples were carefully examined at the expense of the importer, and all showing any signs of infestation were put aside and fumigated; if at all badly infested they were not allowed to be disposed of in this State. Besides this the pest was not new to South Australia; if the petitioning growers had not

actually got it in their own gardens, it had existed for at least three years in one or two gardens within a few minutes' walk, and was known to exist in several other parts. Fortunately, however, it did not appear to be at all troublesome here; why, he could not say, unless kept in check by parasites. Still he could assure growers that he did not consider the existence here of any pest any reason for exercising less vigilance in preventing the importation of infested fruit.

Drought-resisting Fodder.

Mr. MARSHALL stated that some time last year he obtained from Mr. Summers plants of a grass which was well worth growing for stock. Although planted near some gums it stood right through the summer and had stooled out well, making bunches 6in. to 9in. across.

In reply to question, Mr. Summers stated he believed the grass was *Millium multiflorum*, one of the millet grasses; it was a very hardy perennial, and both horses and cattle were fond of it. It grew best on sandy soil with a fair amount of moisture. It was not advisable to sow it on rich moist ground, as it seeds very freely and might become a nuisance. The grass was grown in many suburban flower gardens on account of the graceful seed-heads.

New Members.

The following gentlemen were approved as members of the undermentioned Branches:—Scal-s Bay, Mr. A. Plush; Boothby, Messrs. R. Leonard, A. F. Henderson; Mundoorra, Mr. F. X. Beck; Maitland, Messrs. H. G. Tossell and A. Kelly; Eudunda, Mr. A. E. Gosling; Johnsburg, Mr. John Luckraft; Stockport, Mr. R. Hoepner; Reeve's Plains, Mr. R. H. Oliver; Golden Grove, Mr. Carl Angove; Balaklava, Mr. T. A. Thomas; Paskeville, Mr. S. R. Price; Wilson, Messrs. J. S. O'Grady and D. Sexton; Port Elliot, Mr. W. W. Hargreaves; Orroroo, Messrs. W. T. Brown and Thomas Knight; Naracoorte, Mr. P. Anderson; Lipson, Mr. Geo. Ballie; and Forest Range, Messrs. G. Mason and H. Green.

Reports by Branches.

The SECRETARY reported receipt, since previous meeting, of sixty-six reports of Branch meetings.

REPORTS BY BRANCHES.

Pine Forest, April 15.

Present—Messrs. F. Bayne (chair), J. Phillis, F. Masters, and R. Barr (Hon. Sec.).

MANURES.—Members favor the exclusive use of Wallaroo superphosphate in future, on account of its quality and the saving of freight. The bags are newer and less affected by the super., and there is a certainty of procuring it when wanted. Members decided that the most profitable dressing for this locality is from 70lbs. to 80lbs. per acre. Mr. Bayne had tried the plan of dropping the seed and manure with the hoes detached, and then ploughing in a stubble that was too thin to burn, but too thick for the drill, and was satisfied with the result. Mr. Masters was doing the same where roots are a hindrance. Many farmers in this locality prefer to sow in front of the plough, even when the land is perfectly clear.

ONION-GROWING.—Mr. Phillis mentioned a phenomenal crop of onions raised by a neighbor on an irrigated plot. He took 9½ cwt. from a piece of land 10yds. square—30ft. by 30ft.

Kapunda, April 5.

Present—Messrs. W. M. Shannon (chair), G. Teagle, H. A. Holthouse, W. Flavel, Peter Kerin, C. E. Weckert, G. Harris (Hon. Sec.), and one visitor.

S A. FARMERS' UNION.—After some discussion upon the working of this union it was resolved to arrange for a public meeting if the management will send someone to explain the principles of the organisation.

Rhine Villa, April 26.

Present—Messrs. W. Farey (chair), F. F. Payne, A. Lewis, J. W. Vigar (Hon. Sec.), and one visitor.

PICKLING SEED WHEAT.—The Chairman had tried pickling with salt and lime, but preferred the bluestone treatment. Members generally use about 80zs. of bluestone to the bag of wheat. A stronger pickle destroys too much grain.

QUANTITY OF SEED.—The Chairman usually sows wheat at rate of one bag to ten acres, but most members prefer 35lbs. to 40lbs. to the acre. The Chairman stated that at the Wagga Experimental Farm he had seen promising-looking crops where only 5lbs. per acre of seed had been sown, the grains being dibbled in at 9in. apart.

Reeve's Plains, April 18.

Present—Messrs. W. H. George (chair), A. Arnold, Henry Day, W. Cawse, Hubert Day, E. Hancock, P. Marshall, W. Day, J. McCord (Hon. Sec.), and two visitors.

MAKING THE BUREAU MORE USEFUL.—The Hon. Secretary read a letter on this subject to the following effect:—

As a member of the Bureau and a reader of the *Journal of Agriculture* he was convinced that it was nearly time something was done to improve the work of the Branches. A great deal has been written on the subject of improving the meetings and very many suggestions with this end in view have been made. Members may suggest this, that, or the other idea of doing this, but in his opinion nothing much in the way of improvement will be accomplished until we can get each individual member to do his best; let each one recognise that unless he makes a point of attending regularly and helping the Branch will soon be a thing of the past. If they would do this instead of leaving the brunt of the work to the Chairman and Hon. Secretary, as is very often the case, they would soon have real live practical meetings. There seem to be a great many members quite satisfied if they attend one meeting in three—sufficient to keep their seats. They get the *Journal* free and all the advantages to be obtained by being members, but do nothing in return. It was quite time that the rule that the Secretary should specially notify those members absent for two meetings in succession was altered; it simply allows undesirable members to continue on the roll. He did not see that Mr. Grasby's suggestion to increase the membership of the Branches would do any good. Each Branch is allowed fifteen members, and the average attendance should be at least twelve, whereas it is doubtful if it is more than eight. If each member took his share in the work, fifteen members was quite enough to make the meetings rather lengthy. He thought they might perhaps allow a member of two years' standing to retire and become a sort of life member and allow someone else to take his part as an active member. Then some of the Branches thought the women folk should be eligible for membership. He thought, however, they could do better work in other ways. Let them arrange quarterly socials to which the wives, families, and friends of members could be invited. They would then become better acquainted with one another, a more friendly feeling would exist, and the ladies could talk over ideas on cooking, gardening, poultry, and other matters in which they were interested. This would make an ideal homestead meeting and would, he believed, result in much good being done. To carry out these homestead meetings properly entailed a greater expense than many of the best men could well afford, but if the gathering was held at the usual meeting place and a committee of ladies undertook to look after the providing of eatables, &c., each member would feel that no distinctions were made between them. If the meetings are held at the schoolhouse it

would be a good plan for the Branch to arrange for experimental plots to be looked after by the elder boys, and to give small prizes for the best kept plots as an inducement to the boys to take an interest in agricultural matters. Then the suggestion of lectures courses is hardly worthy of consideration; if they are to become a regular part of the Bureau work it would mean that another officer would have to be appointed to look after it, which he believed the majority of Branches would oppose. As far as the Central Bureau was concerned he thought the members were worse than the majority of the Branches in the matter of attendance. The same rule that is applied to the Branches should be adopted by the Central Bureau. This done and the members who neglect to attend removed from the roll, the delegates to the Annual Congress should be allowed to elect, say, half a dozen real practical men as members of the Central Bureau.

CHARLOCK.—An interesting discussion took place on this subject. The Chairman stated that a neighbor had said he did not harrow after drilling in the seed, but waited until the wheat was up. The young charlock plants were then easily destroyed, and the crop was fairly free from undergrowth. Several members expressed their intention of trying this method.

Port Pirie, April 26.

Present—Messrs. G. M. Wright (chair), T. C. Jose, T. Bell, G. Hannan, W. Smith, E. J. Hector, H. Williams, P. J. Spain, H. B. Welch, F. Humphris, and T. A. Wilson (Hon. Sec.).

PICKLING WHEAT.—Mr. Spain stated that Professor Perkins had advised him that Professor Lowrie pickled seed wheat with formalin solution, in much the same way as bluestone was used. He dissolved 2ozs. of formalin in 5galls. of water, sprinkled the heap, and stirred thoroughly until all the grain was moistened.

VISIT TO NEW SOUTH WALES.—Mr. Welch gave a very interesting account of a recent visit to New South Wales. He was, on the whole, well pleased with the New England district, but expressed surprise at the comparatively small area of the land that was cultivated.

Stockport, April 26.

Present—Messrs. G. Thomas (chair), D. G. Stribling, A. Callier, J. Smith, J. F. Godfree, J. Smith, jun., C. W. Smith, T. Megaw, C. Hartnett, T. Howard, A. Branson, T. Hogan, and J. Murray (Hon. Sec.).

TREE-PLANTING.—Mr. Godfree read a paper at previous meeting on this subject to the following effect:—

This district was naturally deficient in timber, and it seemed absolutely necessary that trees of some sort should be planted. Their stock required shade and shelter, and if clusters of trees were planted in the corners of the paddocks they would not only provide shelter, but would add considerably to the appearance of the place. Belts of trees planted at some considerable distance from the garden and homestead would be of great protection from cold winds in bleak open country. Large trees must not, however, be planted too close to the houses, as the roots become a nuisance, and the accumulation of leaves is a source of annoyance, and generally it results in the trees being cut down just when they are worth seeing. Where firewood is scarce, or likely to be, it would be of great advantage to have considerable areas of trees planted. Some time must, of course, elapse before the trees are fit for firewood or fencing. In three-cornered paddocks a corner could easily be spared for trees, and on bare rises where wheat is not grown it might pay to plant wattles. In sandy country nature has been liberal with timber, though it is not as a rule of much value; where clearing is necessary useful trees should be planted in clumps or belts to prevent the sand from drifting.

SEEDING.—Mr. Thomas initiated a discussion on this subject. Seed should be sown about 1 in. to 1½ in. deep. When he first used the drill he planted too deep, and the crops suffered. Late wheats are best for hay, as they give a better color. Most farmers sow a little stubble land for hay. In his opinion, fallowed land does not produce such good hay as stubble land, there being a

tendency to rankness. For hay he would sow more seed than for grain. In a thick crop the color was better low down. He would scarify the stubble 2in. to 3in. deep before drilling, and harrow afterwards. Roll the wheat when 5in. or 6in. high. He sowed a bushel of seed to the acre, and pickled with $\frac{1}{2}$ lb. bluestone to the bag. Mr. J. Smith sowed about 2in. deep. One year he tried to cultivate between the rows of wheat with the drill, but gave up after doing three rounds. The portion treated did better than the rest of the paddock. Mr. Hogan also put the wheat in 2in. deep.

Minlaton, April 26.

Present—Messrs. Thos. Brown (chair), H. Boundy, E. Correll, R. G. Newbold, Jos. Martin, D. G. Teichelmann, and J. McKenzie (Hon. Sec.).

IMPROVEMENT OF BUREAU.—Considerable discussion on this subject took place, and, on the casting vote of the Chairman, a resolution favoring the retirement of one-third of the members of the Central Bureau, and also of the Branches, each year, retiring members to be eligible for re-election, was carried.

Maitland, May 3.

Present—Messrs. T. Bowman (chair), J. Hill, C. F. G. Heinrich, W. Wilson, J. Kelly, O. Treasure, R. H. Wundersitz, W. Bowey (Hon. Sec.), and one visitor.

MANURING GRASS LAND.—The Hon. Secretary agreed to undertake experiments in the manuring of pasture lands, under the direction of the Inspector of Fertilisers.

DETERIORATION OF FERTILISERS.—Mr. Heinrich wished to know if commercial fertilisers degenerated by keeping over for a season. [Of the phosphatic manures used here only the supers. are likely to suffer by keeping. Much will depend on the condition of the super. If it is kept dry and has been well made it will revert a little; there will be no actual loss of plant food, but some of it becomes less soluble. If the super., however, is allowed to get damp considerable changes may take place.—GEN. SEC.]

Elbow Hill, April 24.

Present—Messrs. J. T. Robertson (chair), H. Dunn, W. Ward, S. Pike, J. Wake, J. Harvey, G. C. Dunn (Hon. Sec.), and four visitors.

"THINGS WORTH CONSIDERING."—Mr. T. J. Brooks forwarded a paper on this subject, to the following effect:—

First, we have the dairying industry, which in the past has been neglected to a very large extent. As a so-called by-product of the farm, dairying should take a very prominent part. There was a time when it was possible to overtake the demand for butter, and unremunerative prices prevailed. Thanks, however, to the work of scientists and theorists, we have now an almost unlimited market for good butter and other dairy produce. In the cream separator and the perfection of refrigerating machinery the work of these men greatly aids the industry. Men of considerable experience tell me that an average of 7d. per pound for butter will pay expenses of production, below which the price rarely falls, and then only for a short time. To make a success of dairying certain things are essential. First, you must have good cows; then you must provide good food and plenty; and third, and perhaps of most importance, you must produce a first-class article. A second-rate article costs quite as much to produce, and returns very much less money; here is where the profits often go. A reasonable amount of care and attention to details means the production of a good article. The dairyman really has the matter under his control; unlike the wheatgrower, who has to depend so much on the

weather in the quality of his produce. There were very few farmers in this district who could not keep half a dozen cows, with but very little outlay for feed. Most of the work could be done by the family; the storekeeper's bills would be lessened; and there would, in addition, be some money coming in. Six cows, properly treated, should return at least £5 each per annum. Then there are pigs. Every farmer should have at least a dozen porkers for sale each year. Here, again, one essential to success is suitable stock; pigs that will grow quickly and put on meat at the least expense for feed are required. To get a maximum of profit a pig should weigh 60lbs. to 70lbs. at five months. He should not be kept longer than this, as he is readily marketed then, and will return a greater profit proportionate to the food consumed than if kept longer. It is not profitable to stint the pig in feed at any time; if he is to grow quickly he must have all the feed he requires. It will require about 3bush. of wheat to bring him to the right condition at five months. This shows an outlay of £4 10s. for wheat for twelve pigs, against a return of £10 10s., with pork at 3½d. per pound. Another source of income is poultry. Here, again, we must secure good birds to get profitable returns. For the farmer it will probably be better to have crosses running together; birds that will lay well and make fair table poultry. You cannot get the best of both qualities in one strain, but by care and attention you can secure good results in both directions—birds that will lay a fair number of eggs and always command a fair market price as table poultry.

Eudunda, April 28.

Present—Messrs. J. von Bertouch (chair), H. D. Weil, J. Lampard, W. F. Sieber, R. Kluske, F. H. Walter, W. Marshall (Hon. Sec.), and two visitors.

EXPERIMENTS.—Mr. R. Kluske reported land ready, and Messrs. Sieber, Pfitzner, and Krummel appointed a committee to assist in conducting experimental work in the cultivation of various crops. Mr. Walter reported that he had sown 4½ozs. Gamma wheat (at rate of 30lbs. per acre) on poor land, but fertilised with 32lbs. super. and 72lbs. stable manure per acre. The yield was 5½lbs. good wheat, or at the rate of 17bush. per acre.

IMPROVEMENT OF BUREAU.—Whilst recognising the valuable services of the Central Bureau as at present existing, members favor reorganisation; and would like to see an increase in membership of Branches.

Arden Vale, April 21.

Present—Messrs. E. H. Warren (chair), M. Eckers, C. Pearce, A. W. Fricker, G. Miller, F. Schuttloffel, P. Starr, W. Williss, A. Hannemann (Hon. Sec.), and six visitors.

IMPROVEMENT OF BUREAU.—Mr. Fricker thought the University, Chamber of Commerce, Royal Agricultural Society, and other institutions ought to be represented on the Central Bureau; but membership of the Branches ought not to be increased. Chairman thought half the members of Central Bureau should be elected by the Branches, and the others appointed by the Government. The Chairman should be elected yearly. After discussion, members agreed that new blood is desirable for the Central Bureau; but the members of that body should devise the best scheme to obtain it. The membership of the Branches should not be increased.

Mundoora, April 25.

Present—Messrs. R. Harris (chair), J. Blake, W. Aitchison, W. Mitchell, D. Owen, A. E. Gardiner (Hon. Sec.), and one visitor.

STOCK COMPLAINTS.—Members were pleased to learn that there was no foundation for the impression held by a good many in this district that the services of the Government stock inspectors could not be secured, except by the farmer paying their travelling expenses. Members agreed that it would

be well for farmers to supplement the ordinary feed during autumn as a precaution against trouble, and not to wait until the animals showed the effect of lack of nourishing food. Mr. D. F. Kennedy said he found that when the cattle got so bad that they lay down and were not able to move about easily it was generally too late to do much good.

BEST WHEATS TO SOW, AND WHEN TO SOW.—Considerable discussion took place on this subject, and it was agreed that the slower-growing wheats should be sown at once, and on clean land, so that the weeds did not rob or choke the plant. Scotch Wonder, Leather Jacket, Phillis Marvel, Dart's Imperial, and others were mentioned as having proved suitable to this locality. For late sowing Steinwedel and Early Para were mentioned; the latter was found to stand up fairly well if drilled in. Mr. Kennedy advised members to stick to any good proved varieties they had. He had lost heavily on one occasion by planting largely of new kinds. However highly any kind was recommended, it was not advisable to grow more than a small area unless it had already been proved to do well in the locality.

Mount Remarkable, April 17.

Present—Messrs. C. E. Jorgensen (chair), W. Lange, J. McIntosh, T. P. Yates, W. Foot, F. W. Baeker, and J. O'Connell (Hon. Sec.).

DAIRYING.—Paper read at Crystal Brook Branch by Mr. W. Natt was discussed. Mr. Jorgensen did not agree with the writer's opinions on the progeny of the Jersey bull crossed with Shorthorn cows. Most of his cows were bred this way, and though the steers were smaller than the Shorthorns, this was more than made up in the superior quality of the dairy cows.

STARLINGS.—The Chairman called attention to the fact that starlings were becoming very numerous in this district, and unless steps were at once taken to destroy them they would become a greater nuisance than sparrows.

Johnsburg, April 19.

Present—Messrs. G. H. Dunn (chair), W. Buchanan, P. Caughlan, W. McRitchie, J. R. Masters, L. Chalmers, J. Sparks, F. W. Smith, T. Johnson (Hon. Sec.), and one visitor.

QUANTITY OF SEED TO SOW.—Mr. Chalmers initiated discussion on this subject; he considered as a rule too much seed was sown in this locality. With the limited amount of moisture plants sown closely must suffer. Mr. McRitchie has reaped an excellent crop from less than $\frac{1}{2}$ bush. of seed. Members generally were of the opinion that on stubble land $\frac{1}{2}$ bush. and on fallow $\frac{1}{2}$ bush. of seed was about the right quantity to sow.

GREEN FEED FOR POULTRY.—The Chairman mentioned that the leaves of the African boxthorn made excellent feed for poultry when green feed was scarce, and strongly recommended members to plant it for this purpose. A branch with the leaves on placed in the chicken coop is readily eaten by chicks or young turkeys. The plant comes into fresh foliage early in the autumn, when there is very little green feed about. Mr. Smith also recommended this plant; not only were the berries eaten by poultry, but it made splendid shelter, and the green leaves came in very useful. Mr. Caughlan said saltbush chopped fine and mixed with bran made an excellent substitute for green feed. A mixture of two parts crushed wheat and one part copra cake fed once a day to laying hens would increase the egg supply. [The copra cake should be used with considerable discretion; it is very stimulating, and if fed in the way suggested may increase the egg supply for a few months at the expense of the future.—
GEN. SEC.]

Millicent, May 1.

Present—Messrs. H. F. L. Holzgreffe (chair), B. Crouch, G. Mutton, H. Oberlander, H. A. Stewart, J. Davidson, A. E. Hutchesson, and E. J. Harris (Hon. Sec.).

SOUTH-EASTERN CONFERENCE.—Mount Gambier and Tatiara Branches approve of proposal to divide the South-East into two districts for purpose of holding two Annual Conferences instead of one for the whole district. Naracoorte Branch does not approve of proposal.

SPARROWS AND FOXES.—The Chairman stated that sparrows could be destroyed in large numbers at this season of the year by feeding for a few days on good wheat and then substituting the poisoned grain. Mr. Stewart said poisoning of foxes could be successfully carried on now. A good deal of discussion took place on the action of some landowners in this district in preserving the foxes. Members considered it better to put forth vigorous efforts to destroy the foxes as they do not kill a great many rabbits.

EMMER WHEAT.—The Hon. Secretary read a very laudatory account of qualities of this newly-introduced wheat. It is hardy, drought and rust resistant, stands extremes of cold and heat, and yields heavily. [This wheat produces a very hard and dark grain, suitable for stock feeding, but not for general purposes like our wheats. It may probably prove of great value to persons engaged in improvement of wheats by crossing. Although spoken of as drought resisting, it is grown most largely in districts with rainfall of 15in. to 18in. per annum, which is above the rainfall recorded in a number of our wheat-growing areas. If the grain could be procured at a reasonable rate it would probably pay to grow for stock-feeding.—GEN. SEC.]

COLOR IN CHEESE.—The Chairman asked why it was South Australian cheese was so highly colored; the presence of so much coloring could not possibly improve the quality of the cheese. Mr. Davidson stated that it was merely a question of public taste; nothing but a highly-colored cheese would sell here. He had made cheese colored similar to the New Zealand cheese, but the public would not buy it, cheese otherwise of the same quality, but with nearly three times as much coloring matter, being demanded.

Burra, May 9.

Present—Messrs. F. A. S. Field (chair), E. Goodridge, R. J. Needham, J. Flower, A. McDonald, J. A. Arnold, W. Heinrich, J. Duldig, J. Scott, and R. M. Harvey (Hon. Sec.).

IMPROVING USEFULNESS OF BUREAU.—Members were of opinion that Mr. Grasby's suggestions for improving the usefulness of the Bureau were more applicable to the Central Bureau than to the Branches. There was, however, a unanimous feeling that it was desirable to increase the membership of the Branches.

STOCK COMPLAINTS.—Mr. R. J. Needham, Deputy-Chief Inspector of Stock, read the following paper:—

CEREBRO-SPINAL MENINGITIS IN HORSES.

Definition.—Inflammation of the spinal cord, brain, and coverings. This appears to be comparatively a new disease, and is apparently confined to Australia and America, as very little is heard of it in the older countries.

Causes.—Many theories have been advanced to account for this very fatal disease in horses. Poisonous substances taken into the system, atmospheric influences, bad ventilation, have been cited as causes; but the general opinion appears to be, in America, that the cause is wormy or mouldy food, as numbers of horses die after being some time in the stubble paddocks. There is also a theory that it is caused by impurities in the water, which have a

toxic effect on the system. Twenty-three cases of this disease have been examined in this district since January 1st, and some of the horses died on very good pure water, so that theory did not appear to hold good here; and the probability is that inferior wormy or mouldy food is the principal cause of the disease in this district, because we generally lose horses every year off the stubble paddocks or in the grass paddocks when the grass is quite dry and has been spoilt by showers of rain. The symptoms of this disease are a loss of power, which may develop gradually or suddenly; twitching of the muscles; locking of the jaws is sometimes seen; the animal has a stiff staggering gate, finally falls and is unable to rise and cannot lift its head off the ground; bowels costive; in some cases temperature increases, but after a time decreases; the power of swallowing appears to be lost.

Treatment.—All cases where the brain is the seat of the disease are fatal; no treatment so far appears to be of any value. Where the spine only is affected the animal frequently recovers if laxative food is given with 1drn. doses of iodide of potash for three or four days. Of the twenty-three horses affected recently in this district nineteen died and three were treated as above, the spine only being affected, and two recovered and one died. A change of food and water is first and best preventive measure.

Post-mortem Appearances.—Both brain and spine are found to be congested and considerable effusion is found to have taken place. The other organs are not in an abnormal condition. Four *post mortems* were recently made in the district.

DISEASES OF THE DIGESTIVE ORGANS OF CATTLE.

Impaction of Omasum and Paralysis.—This disease is also known as asthenic apoplexy, staggers, clue bound, peck bound, vertigo, swimming in the head, &c. The disease is of grave importance to stockowners in this district as it causes the loss of hundreds of cattle every year, and appears to be on the increase, more cattle having died from this cause during the past season in the central district than for many years past.

The Symptoms are often very vague at first and are attended by dullness, a disposition to stand about, often to stiffness and dragging of the hind legs, sometimes there is delirium, and if the disease is not checked in the early stages by a strong cathartic and proper management, congestion of the brain and spine, paralysis, and death soon follow. The animal becomes still more drowsy, is constantly lying down, and if roused up only walks a few yards and lies down again; continues to chew, but there is no cud; animal does not eat or drink; the power of deglutition is lost; is now unable to rise; the tongue is often lolled out before death; there is usually little or no fever, and pulse about normal; the head is often round at the flank, and frequently the animal dies in that position.

Treatment.—When congestion of the brain had set in, i.e., when the animal cannot rise or does so with great difficulty, treatment is of very little use; the cases are nearly always fatal, but in the early stages one of the drenches in the list of drenches and tonics attached should be given, the drench should not be repeated, but the after-treatment should consist of repeated doses of nerve stimulants and tonics.

Drench.—Twelve ounces to 1lb. Epsom salts, 2ozs. ground ginger, 2drms. nux vomica, 1lb. to 2lbs. treacle; mix with 2qts. of warm linseed tea. 2. Epsom salts 12ozs., gentian loz., ginger loz., and loz. carbonate of soda; mix and give in quart of warm linseed mucilage. 3. Sixteen to 24ozs. Epsom salts, 2ozs. ground ginger, 2ozs. gentian, loz. carbonate of soda, 2ozs. sulphur; mix and give in from 1qt. to 2qts. of warm water or thin gruel.

Tonics.—Quart of warm ale, 2drms. of nux vomica; repeated after six hours three times, at intervals. 2. Salt 10lbs., sulphate of iron 1lb., and 10lbs. bonemeal; mix and give handful with a little food daily. Keep supply of the salt and iron and meal in a trough for animals to lick. If dam water used put lime with it.

But after all the most important thing is prevention. When the first case has been seen give your cattle that are apparently healthy one of the drenches; remember that they are all under the same conditions, that none of them are safe, however well they look, and that it is nothing new to lose ten or twelve valuable cows in a few days. Their food must be changed—if on dam water put them on to hard water if possible, feed generously on food rich in phosphates. Keep a supply of the following lick:—20lbs. salt, 20lbs. bonemeal, 1lb. sulphate of iron; mix a few handfuls of this in their feed, and keep same in a trough for them to lick. Salt alone judiciously used is a splendid thing for this trouble—not half enough is used amongst our stock—and wherever we have succeeded in inducing owners to use plenty of salt this disease has gradually disappeared; and in parts of this district where the disease was most prevalent owners are using salt, procured, I think, from Snowtown lakes, freely, with good effect.

Post-mortem Appearances.—The third stomach, omasum, or manifolds, is found generally impacted and is often quite dry, the leaves of the stomach black and powdering up with the dry food when rubbed, the small intestines are generally empty, the rumen well filled, the bladder empty, and the gall bladder very full with the fluid much darker than usual, sometimes like ink, and the brain acutely congested.

Causes.—The disease has been attributed to many causes, but the dry innutritious and

indigestible food and the want of phosphates in much of our soil is probably quite enough to account for the disease. It has been observed in parts of the district where this disease recurred every year that the use of artificial manures has had the effect of greatly lessening the number of cases.

Mr. Needham strongly recommended stockowners to give their cattle and sheep a liberal supply of salt. On the Peninsula, damping hay and straw with brine when stacking was practised by a number of farmers, and must be beneficial to stock. He noticed that stock depasturing on land manured with commercial fertilisers were generally healthy, owing, he believed, to the phosphates in the feed. The Chairman stated that when driving his sheep to water recently two or three fat ewes staggered and fell, and were unable to rise. He poured water down their throats and left them. In about half an hour's time they were able to rise and join the rest of the flock, apparently none the worse. For gripes in horses Mr. Needham advised sub-cutaneous injection of morphia. All stockowners should keep a hypodermic syringe for this purpose. They could easily detect the difference between gripes and inflammation of the bowels. Gripe pains were spasmodic, while the latter were incessant. Mr. Scott had administered carbonate of soda with success for gripe. In reply to question, Mr. Needham said the normal temperature of cattle was 101° F.; 103° would be considered dangerous, though higher temperatures were recorded.

Lipson, April 19.

Present—Messrs. Geo. Provis (chair), W. F. Darling, H. Brougham, S. F. Potter, C. Provis, J. Brown, J. Wishart, A. B. Wishart, Geo. Carr, Jas. McCallum, E. J. Barraud (Hon. Sec.) and five visitors.

SCOUR IN HORSES.—Mr. C. Provis asked for a remedy for scour in horses. Members did not think the use of rusty hay would tend to induce scouring. The removal of the afterbirth from a cow was also referred to, members being of opinion that a light weight attached to it would bring away the afterbirth in a short time.

OFFICERS.—Messrs. S. F. Potter and J. McCallum were elected Chairman, and Vice-chairman respectively, and Mr. E. J. Barraud re-elected Hon. Secretary for ensuing year.

Yorketown, May 10.

Present—Messrs. J. Koth (chair), C. Domaschensz, A. Jung, G. Bull, C. H. Davey, R. Newbold, and John Davey (Hon. Sec.).

PICKLING SEED WHEAT.—Farmers in this locality generally use $\frac{1}{2}$ lb. of bluestone to pickle 4 bush. of seed; but if the ground is dry they use a little less. There is always less bunt if the seed is allowed to dry before it is sown.

GRIPES IN HORSES.—In answer to question, Mr. Jung said he successfully used five drops of arsenicum and five drops of arnica, alternately, at five to fifteen minutes. He placed these on the tongue of the animal. Other members confirmed his practice.

WORMS IN HORSES.—Several members tie a stick of tobacco on the bit of any horse affected with worms. This is done before they go to work.

COST OF GROWING WHEAT.—Mr. Bull gave the following estimate of the cost of growing an 8-bush. crop of wheat on an acre of land:—Ploughing, 4s.; drilling, 1s. 6d.; seed wheat, 2s. 6d.; pickling, 1s. 6d.; manure, 4s.; twice harrowing, 1s. 6d.; stripping, 3s.; cleaning, 1s.; carting, 1s.; rent, 2s. Total cost of 8 bush. of wheat from one acre of land, 23s.

Mount Gambier, April 10.

Present—Messrs. W. Mitchell (chair), J. Watson, D. Norman, sen., A. J. Wedd, M. C. Wilson, J. C. Ruwoldt, and E. Lewis (Hon. Sec.).

LICE IN SHEEP.—Mr. Wedd agreed that sheep dipped now would hold enough dip in the wool to destroy any newly-hatched lice, even if it did not destroy the eggs. He did not agree with Mr. Williams as to poor and fat sheep being equally liable to lice. Several members supported Mr. Wedd on this point.

TREE-PLANTING FOR PROFIT.—Mr. Wedd referred to possibility of reclaiming waste lands and planting them with trees. There was a lot of poor land in the South-East that could be profitably planted with wattles, pines, or even stringybark. Mr. Dyke condemned *Pinus insignis* as useless for timber or firewood, and suggested that the elm would pay in some parts. On the Casterton road a strip of poor stringybark land was rung; the next year it was burnt, and the young trees had grown very thickly, and there was now a fine crop of saplings, which in a few years would be very valuable. The Chairman thought it would have been better if the country near the Border had all been reserved for timber. Mr. Wedd said stringybark and blackwood were rapid growers. Wattles, also, would pay well, and much inferior land could be utilised for this purpose. In nine or ten years, from sowing seed on a strip of sandy and ferny land, he had some trees 50ft. high. Mr. Norman put in an acre of wattles sixteen years ago, and since then had taken out about 3,000 hop-poles, and sold bark to the value of £20. The bark on the trees now growing was worth quite £10. Mr. Ruwoldt found *Pinus insignis* made excellent pickets, was good for boxes, and also for indoor work; it would not split, but was brittle. A number of trees of various sorts were mentioned as doing well in the district, and their cultivation on a larger scale was suggested.

Lucindale, May 17.

Present—Messrs. E. Feuerherdt (chair), S. Tavender, H. Langberg, A. Matheson, A. Carmichael, and E. E. Dutton (Hon. Sec.).

CONFERENCES.—Members are not favorable to a division of the South-Eastern Branches for the purpose of holding annual conferences in two localities.

OFFICERS.—The Chairman and Hon. Secretary were re-elected.

EXPERIMENTS.—Messrs. Tavender and Carmichael undertook to conduct experiments in cultivation of grasses with fertilisers.

GRASS TREES.—Mr. Langberg wished to learn a cheap method of killing grass trees (*Xanthorrhoea* sp.). Referred to General Secretary. [Chop out the centre with an adze and pour on the edges of the cut portion a pint of solution of arsenic dissolved with soda. 1lb. of arsenic, 2lbs. of washing soda, 5galls. water. Take care that the children and the farm animals do not get at it.—GEN. SEC.] The Chairman said he intended to try 1lb. arsenic and sufficient soda to dissolve it in 10galls. water, bore a hole in the centre of the "yacca," and pour a little of the solution in it.

PLANTING TREES.—The Chairman read the following paper:—

The time is now at hand for the planting of timber, ornamental, or shelter trees, for it has been my experience that young trees planted in autumn do far better than those planted out in winter or early spring. Young trees can now be obtained from the Forest Department, and no time should be lost in asking for all you require. I have found it a good plan when ordering to get a few of each variety over the number required. Put these into a little plot in your garden and they will be then ready to fill the gaps caused by failures, for there are nearly always failures, look after them as you will. In most

places the newly-planted trees will require looking after during the first summer, by keeping weeds from them and, if in a dry situation, watering them occasionally, and you will find it labor well repaid. The trees also need protection from stock, rabbits, &c., which seem to take a great liking for anything not found growing plentifully in their feeding grounds.

Now for the varieties to plant. If in stiff strong soils, a good quick-growing windbreak is the wattle, or, if a permanent close break is required, the African boxthorn. This latter has its disadvantages, not the least of which is the harbor it affords to sparrows. The tagosaste also makes a very good windbreak, is a fairly rapid grower, and if frequently trimmed after its sixth year will afford a deal of fodder for cattle or horses.

For timber and ornamental growth on strong soils I would recommend the sugargum and the South Australian bluegum. If planted thickly good straight timber will result. Tasmanian bluegum is a strong rapid grower, but is very subject to attacks from a caterpillar which disfigures the trees and eventually kills them. Besides this the timber is not very durable. A very useful timber tree, also a shapely strong-growing one, is the Yate gum, the timber of which is exceptionally strong and well suited for all purposes requiring a timber that will not break off short. It is very suitable for poles, shafts, and swingle-trees on wagons and farm implements.

Then on sandy soils the various pines and cypress do exceedingly well. If on a very windy bleak spot I would plant the maritime pine. On the more sheltered spots the remarkable pine (*Pinus insignis*) and the Aleppo pine. Some of the cypress varieties, if planted closely and trimmed, grow into splendid hedges and make an ideal shelter and breakwind. The tamarisk (*Tamarix gallica*) also can be formed into an excellent break by close planting and trimming, and grows in almost any soil.

If deciduous trees are required for ornament and timber the poplar is a very useful and quick grower. The timber is one of the toughest timbers known. For ornamental growth the white cedar, the various planes, and some of the lesser known poplars grow quickly and make handsome trees.

Then we should not forget our native trees. The sheoak when well grown is a very handsome tree, is ornamental and useful. The native cherry, the blackwood, and the Murray pines, are all worth their places in any plantation. I have raised plants from the seed sown in November and December and planted out in May.

With respect to reserving portions of scrub blocks for timber growing, unless a proviso were inserted in the Crown Lands Act, by which a lessee could set aside a portion of his scrub, and after due notification to the Crown Lands office that such portion is to be set aside for a timber reserve, such portion should be kept free of timber-getters under a Crown licence. If such were done it would pay lessees to reserve portions for their own future use. I have spoken to the Conservator of Forests on this subject and he states that the department would not grant licences in such cases, but we have nothing official under the Act to work on.

Golden Grove, April 23.

Present—Messrs. S. A. Milne (chair), A. Robertson, T. G. McPharlin, J. Woodhead, J. Ross, J. R. Smart, W. Mountstephen, J. R. Coles (Hon. Sec.), and one visitor.

THE LAMB TRADE.—Mr. A. Robertson remarked, to the following effect:—

The prospects of the export of frozen lambs offers inducements to farmers in connection with hay-growing, and those who occupy 300 acres or more should keep a number of sheep proportioned to the area of the farm, upon which a certain amount of fodder must be grown in addition to the natural herbage. A beginner should breed his own stock ewes. The best profit is gained from a cross-bred Merino ewe, and Shropshire or a Dorset Horn ram. For freezing, the progeny of the Shropshire ram is the best; but for local market the Dorset Horn ram will give heavier weights, which are in greater demand. The ewes from either of these crosses are best for stock purposes when used with pure-bred rams. The best time for lambing is about the middle of April. Where lucern or sorghum can be grown it will pay to lamb earlier. A lamb four to five months old will easily realise 12s. to 14s.

The few members who have had experience with sheep think it best to buy ewes for breeding, because of the two years lost before reproduction. The cost of the sheep-proof fencing and other initial expenses is heavy, but there appears to be much promise in the industry. Mr. Robertson said a ewe could lamb at 13 months of age. He maintained that it is advisable that beginners should breed their own stock ewes, because of the risk of getting inferior stuff at the market.

Quorn, May 17.

Present—Messrs. R. Thompson (chair), H. Altmann, G. Walker, F. Herde, J. Brewster, J. W. Smith, J. B. Rowe, W. Toll, C. Patten, James Cook, and W. Noll (acting Hon. Sec.).

PRESERVING EGGS.—Mr. G. Walker advocated the practice of preserving eggs when they are plentiful and when prices are low, and selling them when eggs are scarce and prices are high. With systematic management he believed the fowls would give more profit than could be realised from growing wheat at 2s. 6d. per bushel. The Chairman read an extract showing how eggs are preserved with waterglass. [Full particulars were published in our *Journal* in August, 1900, page 10, and on several other occasions.—GEN. SEC.] Mr. Rowe advocated the sale of eggs by weight, just as apples and other products are sold. This would induce poultry owners to improve their fowls.

COLD STORAGE.—Mr. J. B. Rowe read an article on cold storage, but members thought that practice could not at present be applied to Northern farming conditions.

Kingston, May 3.

Present—Messrs. W. W. Pinches (chair), T. Redman, W. Branch, E. M. Flint, T. A. McCulloch, J. Cooper, G. Bird, H. Fraser, and Fred. S. Wright (Hon. Sec.).

SOUTH-EAST CONFERENCES.—Members favor division of South-East into two sections for the holding of an annual conference in each section.

QUESTION BOX.—Decided to hold meetings occasionally for the purpose of considering, and, if possible, answering any questions that may be submitted.

MARRAM GRASS.—Decided to procure a small quantity of marram grass for experimental purposes.

WATTLES AND WATTLE BARK.—The Hon. Secretary read a lengthy paper, of which the following is a digest:—

He dealt largely with the technical character of acacias—especially of *A. pycnantha* (golden wattle), and *A. decurrens* (fern-leaved or silver wattle). The first analyses from 30 per cent. to 46 per cent. of tannic acid, the greater proportion being in the thick stem bark of old trees, and the lesser quantity in the bark of the branches. The bark of *A. decurrens* is of much less value than that of *A. pycnantha*, but it will pay better to grow this wattle for its bark than to leave the land to produce ferns and scrub on so many thousands of acres of land in the South-East. He suggested that, even if nothing further were done, anyone riding over his scrub, heath, or fern paddocks should carry wattle seed in his pockets, and scatter some in suitable spots. He knew of spots where seeds had been thrown in this way eight or nine years ago, and up till last season the trees were germinating, until at present there were trees varying in age from one to five years. He knew of a paddock which had been grazed for quite forty years, was then ploughed, and after the crop was taken off the ground became a forest of wattle trees. This proved the extreme vitality of the seeds. There need be no fear of over-production of wattle bark, since Australia alone could use up all that is grown. He instanced that South Africa exported, in 1896, 3,216 tons of bark, and South Australia 4,638 tons; whilst in 1901 South Africa exported 11,634 tons, and South Australia 1,743 tons. In six years South Africa has increased her export of wattle bark by 8,418 tons, whilst South Australia has decreased by 2,795 tons. He also stated that the profit to growers of wattle bark last season was near £4 per ton, and advocated the use of wattles as windbreaks. The bark is not so short in the Mount Benson district, the leaves are broader, and the tree is much larger than in the northerly districts. It does best in sandy soil on stony ridges, and grows well in deep sandy hollows, on fern patches, and in heath lands. In July, 1899, he tried experiments in the germination of wattle seeds. When hard boiled for four minutes, 40 per cent. grew; for three minutes, 60 per cent. grew; for two minutes, 40 per cent.; for one minute, 90 per cent.; whilst seeds that were not scalded gave no result. Since then the results have been always favorable when the seeds have been boiled one minute, fire withdrawn, and seed left in the water twelve hours. Twelve pounds of seed require 8galls. of water. Sowing should take place as early as rain will justify, and should be sown on sandy

country, fully 3in. deep. If seed is broadcasted, and then the heath or scrub burned, the burning should be delayed for some months, so that ants and other agencies should bury the seed well below the surface, else the fire will destroy much of it. Bark should be stripped only in September, October, November, and December. January is rather too late, and the tannic acid is weakening. From September to December the sap is rising, and the bark strips easily. If heavy rain should occur later, the sap will rise and the bark will strip easily, but it is poorer in tannic acid. When the tree has just finished flowering is the best time to strip the bark; but as it is impossible to strip thousands of tons of bark within that short time, the next best time must be taken. The wattle is at its best at about seven to nine years of age, and it is unwise to strip the bark before it is at its best and most profitable stage of growth. The bark is stripped by cutting with a tomahawk all around the trunk, about 4ft. above the ground, and pulling the bark off down to the roots, and also from the branches. The nearer to the roots the richer and heavier is the bark. The strippers require careful supervision, as some are liable to slur the work, and neglect to strip the whole of the bark, which is a dead loss. Where a tree has several limbs branching anywhere from ground level to 2ft. high—even although the tree may be mature—the whole five should not be stripped if the tree is healthy. If two or even three of the limbs are left, they will show a wonderful growth by the next season. This thinning out and letting in of the air has been the means of bringing up other wattles to replace those that have been stripped. In their own paddock they strip only once in two or three years. The butt bark should be laid on the ground and the lighter bark on top, enough for a bundle. This must be left in hot weather for at least twenty-four hours to dry, else the bark will be damaged by mould. It is very wasteful to use bark for tying, but rather use hay binding twine. A ton of bark will require about 2s. worth of twine. Bundles should go from thirty-five to forty to the ton. In June, July, August, 1899, his people had eighty running miles cleared 9ft. wide, through honeysuckle scrub, ploughed six furrows, sowed wattle seed on this, and covered it with a brush harrow. There was a splendid germination, but the heat and dry weather of November and December killed all the plants. In 1900 the land was re-sown by a one tyne drill, 3in. deep, with the same result, and in 1901 only a few acres were sown, with a like result. Six years ago a neighbor sowed wattle seed with his oats in July, cut the crop for hay in January, and there is now a thick crop of wattles 14ft. high. Next year he sowed wattles in the same way, and the resulting crop of wattles is only about 1 per cent. of the other.

Forest Range, May 15.

Present—Messrs. G. Monks (chair), A. Green, W. McLaren, J. Vickers, F. Green, J. G. Rogers, R. Green, E. Rowley, R. E. Townsend, J. Green, and H. H. Waters (Hon. Sec.), two visitors, and the Inspector of Fertilisers (Mr. W. L. Summers).

HOMESTEAD MEETING.—Members met at Mr. R. E. Townsend's homestead. The proceedings commenced with a working trial of a large plough, the Oliver No. 56 reversible, manipulated by Mr. Townsend and his assistant. The work performed by this implement was considered by those present to be very good, the soil being broken to a depth of 12in. to 14in., and thoroughly pulverised; in fact it was considered good enough to plant trees in it at once. The smaller plough, Oliver No. 53 reversible garden plough, was next shown at work; it performed its work equally well, breaking the ground to a depth of 12in. Both ploughs were engaged in virgin soil, and were considered to be good implements, though some of the visitors thought there was room for improvement in the shape of the mould-board of the larger plough. Mr. Townsend next showed an Improved Western nine-tooth cultivator, with drilling, hoeing, and moulding attachments, the machine being a serviceable one, especially to market gardeners. Mr. Townsend next conducted the party over his well-appointed nursery, which contained almost every variety of fruit tree. The oil engine at work was also seen, water being pumped to an elevated tank and distributed by means of sprinklers attached to long lines of piping. Mr. and Mrs. Townsend invited those present to partake of their hospitality, of which the greater number availed themselves. After the splendid repast which had been provided was done

ample justice to, a hearty vote of thanks was accorded to Mr. and Mrs. Townsend for their kindness.

FERTILISERS.—By special request, the Inspector of Fertilisers gave an instructive address on "The Purchase and Use of Manures," with special reference to the wants of the market gardener and fruitgrower. He dealt with the analyses of the different brands of bonedust on the market, the use of potassic fertilisers, the value of humus, &c., and was accorded a vote of thanks for his attendance.

RAINFALL.—Mr. Rogers reported that the rainfall for the year 1901, at Forest Range, was 37·66in.

Cherry Gardens, May 13.

Present—Messrs. W. B. Burpee (chair), T. Jacobs, C. Lewis, J. Lewis, G. Brumby, H. Strange, J. Potter, T. Partridge, J. Metcalf, and C. Ricks (Hon. Sec.).

CODLIN MOTH.—A long discussion took place on question of sale of infested fruit, the majority being opposed to the restriction on the sale of fruit.

WATERING HORSES.—Most members favored allowing horses that were heated to cool down before giving them water.

SHEEP AND CATTLE IN THE HILLS.—Mr. Potter initiated a discussion on this subject. He mentioned a number of cases where land in the hills that used to support two or three families all the year round was now used for grazing sheep, and required only one man or a boy to look after them, except at shearing. Land that was used to produce good crops of wheat was covered in briers, which afforded splendid shelter for vermin. It was agreed that the change to sheep was a serious matter, as the supply of milk to the Clarendon factory had fallen off, and if the thing went on it would only be a question of time when it would have to close. The young people were leaving the district because they could not secure work, and going into the already overcrowded centres, or to other States. Members considered it a very serious matter that young men brought up on the land were unable to get a living from the land. The substitution of sheep for cattle, and hay-growing, was largely responsible for the trouble in this and surrounding districts. The Chairman doubted whether sheep would pay here when we got a return of good seasons in the North, and mutton came down to normal prices. It was agreed that, while the keeping of sheep might be profitable to the individual in the hills districts, it was proving injurious to the best interests of the State.

Pyap, May 14.

Present—Messrs. W. C. Rodgers (chair), J. Bowes, W. Axon, J. Holt, A. J. Brocklehurst, J. F. Bankhead, G. H. Mills, C. Billett, E. Robinson, and B. T. H. Cox (Hon. Sec.).

SOIL MOISTURE.—Mr. Bankhead read from report of Conference of Branches held at Tanunda in 1896 a very instructive paper on this subject, prepared by Mr. A. M. Dawkins of Gawler River.

CULTIVATION OF THE SOIL.—The Chairman read the following paper on this subject:—

The most important factor leading to successful agriculture and horticulture is the proper cultivation of the soil. Without it the best possible returns from field or orchard can never be obtained, and the real cause of failure in many cases lies in the indifferent methods employed in tillage operations. In the orchards the main objection to shallow ploughing or simple loosening of the top soil in both winter and summer lies in the fact that the roots of the trees, being unable to force their way through the hard unbroken soil, will remain too near the

surface, the extreme heat of summer injuring them, particularly in this district, where the top soil is of a sandy nature. In order to prevent this the soil should be ploughed deeply in autumn or early winter to a depth of at least 8 in., so that the seasonable rains, as well as the water applied during the summer irrigation, will sink deeper; and also to enable the roots to penetrate to a greater depth, receiving a better and more lasting supply of nutriment. Shallow ploughing or cultivation to a depth of at least 4 in. should follow in early spring and immediately after each successive watering throughout the summer, in order to conserve the moisture and kill the weeds. The fact that friable soil absorbs moisture from the air, and at the same time prevents undue evaporation in hot weather, should always be borne in mind, and the necessary steps taken to keep the soil in that condition. New mallee land should be very lightly stirred for the first crop of cereals, the depth being gradually increased each year, otherwise the growth will be too rank for the first two seasons to withstand the hot weather usually prevailing in September. If possible the drill only should be used for at least the first two seasons, the light ploughing coming next, the seed being drilled in as before. Deeper ploughing may follow to allow the ashes and humus to gradually mix with the older earth. On the stiff clay flats different treatment is required. This soil is formed of successive layers or deposits of humus and fine particles of clay, with a very small proportion of sand. The first ploughing should be as deep as possible, and the mould left in the rough to allow the air, light, heat, and frost to perform their separate functions in the preparation of the soil for plant life. This ploughing should be commenced in early winter or immediately after the ordinary seeding operations have ceased. Where sand has drifted on to the flats before ploughing the effect has been very noticeable; the mixing of sand with the clay during the ploughing operations has rendered it fairly friable, and admits of the roots finding a comparatively easy passage in their search for food. On the less stiff clay flats such deep tillage is not absolutely necessary, the soil in most cases being formed of newer deposits and consequently less compact, often opening up with wide crevices in summer. Heavy crops have been grown on these flats at small cost. The complaint—so often heard—that these clay flats will not grow crops of hay and cereals of good quality may easily be remedied by employing the means stated above for taking the “sourness” out of the soil. The results, even with our light rainfall, would amply repay the cost of working and leave at least a fair margin of profit.

The paper was well discussed, members being generally of opinion that cultivation was necessary to enable the soil to absorb moisture from the air during the night. The Hon. Secretary read from *May Journal of Agriculture* paper by Mr. F. H. Pybus, of Davenport Branch, on “Notes on ploughing.” As the general practice was to plough the reverse way to the previous season’s ploughing, members did not see how it was practicable to plough north and south every year.

Paskeville, May 17.

Present—Messrs. A. Goodall (chair), A. C. Wehr, J. P. Pontifex, W. Westphall, G. Meier, A. Palm, and W. S. O’Grady (Hon. Sec.).

STANDARD SAMPLE OF WHEAT.—Mr. Pontifex complained of the action of the Chamber of Commerce in delaying until so late in the season the fixing of the f.a.q. standard for the season. He had been put to considerable loss through this, and he believed other members, besides numerous farmers, had also suffered. It was decided to ask the General Secretary whether it was not possible, with the co-operation of the Branches, to induce the Corn Trade section of the Chamber to fix the standard earlier. [The Chamber cannot decide upon the weight of an *average* bushel of the season’s wheat crop of the whole of South Australia until samples have come into their hands from *all parts* of the State. The harvest commences at end of October in the earliest district and is finished during January in the latest—by which time some of the earliest wheat could possibly have been sold in Europe. The only plan would be to divide the State into two or three sections for the purpose of the average, and make a final average later on.—GEN. SEC.]

HARROWING GROWING CROPS.—The Chairman said it had been stated that harrowing the crop after it was up caused it to stool more. He found the contrary was the case; on strips harrowed last year the wheat ran up, but on the adjoining strips the wheat stooled much better. He believed, however,

the harrowing was beneficial. Mr. Wehr thought the weather had a good deal to do with the effect of harrowing; if dry weather followed the operation the crop would be inclined to run up, while if the weather was wet the plant would stool. The Chairman said it was advisable to harrow down well after drilling if it is intended to harrow after the crop is up, as less of the crop would be covered over than would be the case if the drill ridges were left.

CHAFF MILL.—Considerable discussion took place on the best means of disposing of the large quantity of hay in the district, and it was finally decided to endeavor to start a chaff mill. Half the required capital was promised by those present, and a committee was appointed to endeavor to carry out the project.

Strathalbyn, May 19.

Present—Messrs. M. Rankine (chair), P. McAnaney, W. M. Rankine, G. Meikel, A. Rankine, G. Sissons, W. J. Tucker, and J. Cheriton (Hon. Sec.).

SEEDING.—Paper read at previous meeting was discussed. Members were of opinion that both early and late kinds should be sown, and rust-resistant varieties when possible. Early wheats should be sown on land subject to weeds, the clean land being sown with the later wheats. Mr. W. M. Rankine stated that he grew a splendid crop of King's Early wheat on land smothered with Cape marigold and other weeds. Pickling of seed wheat was also discussed. Members were all convinced that bluestone is a certain preventive of bunt, but care was necessary that pure bluestone is used. The best way is to thoroughly immerse the seed in the pickle.

WATER CONSERVATION.—Members fully agreed as to the desirability of conserving water by means of reservoirs, and are of opinion that the State should pay far greater attention to this matter, as the money spent would be revenue-producing, and it would employ a lot of labor, besides enabling farmers to go in for intense cultivation. Members were of opinion that the plains of the Angas and Bremer Rivers were most suitable for this purpose, as pumping would not be required, as the land could be watered by gravitation.

ANTHRAX.—The alleged outbreak of anthrax near Eudunda was discussed, and the urgent importance of drastic measures for its suppression was recognised.

MEETING.—Next meeting to be held on June 17.

Onetree Hill, May 16.

Present—Messrs. J. Bowman (chair), F. Bowman, H. Blackham, G. Bowman, J. Flower, F. L. Ifould, E. A. Kelly, M. G. Smith, and J. Clucas (Hon. Sec.).

MANURING OF PASTURES.—Mr. Ifould reported that he was carrying on experiments in manuring pastures with fertilisers received from the Department of Agriculture, under the direction of the Inspector of Fertilisers. Some members were sceptical as to the profitable use of fertilisers on pasture lands, as the outlay was equivalent to a rental of 5s. per acre. It was pointed out that the benefit from the manure would be felt for several years. One member stated that he knew of an instance where a good dressing of manure was applied to a crop, and the benefit could still be seen sixteen years afterwards. Another stated that on a piece of land to which a mixture of bonedust and mineral super. was applied the yield the second year was a bag per acre more than the first year, and the third crop an equal improvement on the second. [When we know that the effect of mineral super. can be noticed for at least three years after

application, it is absurd to debit to the first year's crop the whole cost of an application of a manure specially prepared to last for several years.—GEN. SEC.] It was also pointed out (as a strong argument in favor of manuring grass land) to those who rear lambs for market that the grass on land manured was fully two months earlier than on unmanured land. This alone showed greatly in favor of the practice. It was suggested that the condition attached to the experiments with manures supplied by the department, *i.e.*, that the stock should be kept off until about August, lessened the effectiveness of the test. On the other hand, it was stated that as stock always preferred the grass on manured land, the objects of the experiments would be defeated unless they were kept off until the effect of the manure could be seen. [In addition, how is it possible to judge the result of the different dressings unless stock are kept off for a few months. As there are to be strips of unmanured land between each plot, the extra growth of grass will be better ascertained by keeping off stock than by allowing the pasture to be fed down all the time.—GEN. SEC.] The saving of old feed from one year to another was considered to represent a present loss of $\frac{1}{4}$ d. per sheep per acre; but it was for the sheepfarmers to decide whether it did not mean an ultimate gain. Another point worthy of consideration was that severe winter weather always has a blighting effect on the pastures here, and it was at this trying period that the grass upon manured lands showed unmistakably the benefit of the manure.

GREEN FEED AND DRY.—It was stated that the reason why Cape oats were not grown to any extent in this district was their liability to go down, and a mixture of two parts oats and one part of King's Early wheat was suggested as making excellent hay. Feeding off the young crop with sheep may prove beneficial or otherwise, much depending upon the season. Feeding off made a thin crop stool out, and could also be recommended as an expedient to at least materially reduce the effect of frost. Harrowing the growing crop with sharp harrows has been proved by members to be beneficial. Those members who have tested the relative effect of broadcasting and drilling in manure and seed pronounced in favor of the latter practice.

Port Elliot, May 17.

Present—Messrs. J. McLeod (chair), H. Welch, H. Pannell, S. Inglis, C. Gosden, J. R. Cooke, H. Grey, F. Basham, O. B. Hutchinson, W. E. Hargreaves, H. Green, and J. Brown (Hon. Sec.).

CONFERENCE.—It was decided to see whether a Conference of Branches could be arranged to be held at Port Elliot early in August.

CODLIN MOTH.—It was decided to suggest that the Central Bureau have printed in pamphlet form the best treatment for the suppression of the codlin moth pest. [Several months since the desired information was published in the *Journal of Agriculture* and reprinted in pamphlet form, some thousands of which have already been distributed to growers. Hon. Secretaries can obtain copies on application, or copy will be posted to any grower sending stamps to cover postage.—GEN. SEC.]

POTATOES.—Mr. H. Grey read a paper on potato-growing:—

First plough the land about 6in. deep and harrow down well, then cart and spread the stable manure. Put on the manure about a fortnight only before planting, so that the strength of it is not lost. For dry ground use large potatoes cut into sets with two or three eyes; cut sets will give better results than whole potatoes. By using large potatoes and cutting them you are more likely to get good crops than from the small round seed, unless you are careful to pick the latter out, when digging, from the stalks that bear best. A good set will produce nearly all marketable potatoes, but some will yield a lot of small but good-looking round tubers; these latter have run out to a large extent and do not pay to

plant. For dry ground get seed, if possible, from the late swamps and plant early in August. If this is done the shoots only want breaking off once before planting, whereas if you attempt to keep seed from December till August you have to do this several times, and most of the eyes are spent by planting time. Do not plant until first week in August, as otherwise late frosts may do a lot of harm. Make the rows 2ft. apart to allow plenty of room for earthing up, and the setts 1ft. apart in the rows, and about 6in. deep. When hoeing hoe as deep as you can, as it will keep the soil moist and allow the roots to spread and the potatoes to get the full benefit of the manure that has been ploughed in. Earth up when the plants have been up about a month. When digging bring the potatoes in and cover them up to prevent them going green. In planting cut setts the cut side should be placed underneath. Treatment of potatoes in swamp land would of course be different. Paper was well discussed, members generally agreeing with the writer.

Minlaton, May 17.

Present—Messrs. J. D. Mayor (chair), E. Correll, W. Honner, M. Twartz, A. McKenzie, Jas. Anderson, Jas. Martin, T. Brown, H. Martin, and Joseph McKenzie (Hon. Sec.).

OFFICERS.—Annual report adopted, officers thanked, Mr. T. Brown elected Chairman, Messrs. W. Honner and Jas. Martin Vice-chairmen, and Jos. McKenzie elected Hon. Secretary.

PAPERS.—The members agreed to take it in turn to read a paper or initiate a subject for discussion at meetings.

MANURES.—It was mentioned that Professor Lowrie recommended 2cwts. per acre of superphosphate, but some members consider 70lbs. sufficient in this locality; if more is used the crops are liable to be blighted by hot winds; but the grass will benefit the next year. Question was raised, is any fertiliser produced by the action of the acid used in making super. upon the limestone of this locality? [Sulphuric acid and lime would combine and form gypsum (sulphate of lime), which is not a fertiliser, but in many cases is beneficial.—GEN. SEC.]

Mallala, May 19.

Present—Messrs. J. McCabe (chair), J. Jenkins, W. Temby, J. Nairn, W. H. Franks, S. Temby, A. Moody, T. Nevin, H. Moody, M. H. East, A. E. Wilson, J. Churches, W. R. Stephenson (Hon. Sec.), and two visitors.

DISEASE IN PIGS.—Mr. J. Churches had a pig die suddenly, and, when two others afterwards became ill, he cut off the tips of their ears, and both recovered.

DURATION OF SUPER.—General Secretary to be requested to state how long the beneficial influence of superphosphate on plant life will remain after application to the soil. [For several years if a fair quantity has been used.—GEN. SEC.]

"PRESENT DAY FARMING."—Mr. A. Moody read a lengthy paper on this subject. The following is a digest:—

Water Supply.—This is the most important item, and if the farm is not well supplied every possible effort should be made to secure it. If wells are sunk they should be timbered at once (jarrah slabs preferred) or bricked. Failing wells, a dam of large size should be constructed instead of several small ones, which quickly dry up when water is most required. Much money and labor has been wasted in construction of small inefficient reservoirs and dams. In the dry parts of this State it would be most advantageous for several to combine and construct a reservoir or dam of considerable capacity.

Timber.—It is not wise to destroy too much of the timber or even mallee. The system of mullenising and ringbarking has not been good for the country. A deal of timber and firewood has been thus wasted, which in time would have been of more value than the wheat that has been raised in its place. It is anomalous that, whilst some people are planting grasses and shrubs to prevent sand drifts, neighbors are doing all they can to destroy the scrub and bushes,

and thus allowing the sand to drift in every direction. That the wholesale destruction of timber over the whole area of Australia is responsible for the diminished rainfall has been denied by some persons, but the rainfall in South Australia is now certainly lighter than it was some years ago and the climatic conditions have changed.

Planting Trees.—When planting trees to replace those that have been destroyed, the suitability of the soil and climate for each kind must be very carefully considered, else much time and money may be wasted.

Fencing and other Improvements.—These should be of a more substantial nature than has often been the case. Repairs and patching up are costly and unsatisfactory; and if one wants to sell out, the improvements make it of more value. It is false economy to use bad posts and thin wire that will need renewal in a short time owing to decay and rust. In putting up barns and sheds get as much roof as possible, and use barbed wire and wire netting to keep animals away until galvanized wire can be obtained.

Horses.—Light draught horses are best for ordinary farm work, as they are moved quickly in fallowing, seeding, harvesting, &c., when speed is important. A few good draughts should be kept for wagon or trolly work, and a few foals should be bred every year.

Cattle of various breeds have lately been introduced. If they are not kept as separate breeds there will soon be a curious mongrel breed extant. The Durham seems to be the best all-round breed for milk and beef, as well as in all other points.

Sheep.—A few sheep should be kept if there is enough of good water and sufficient land. The paddocks must be sheep-proofed. Do not overstock; but keep only as many as can be maintained through a bad season for feed. If overstocked the break in the wool occasioned thereby will entail considerable loss, and perhaps a part of the flock will have to be sacrificed in order to save the lives of the rest. By rational stocking the good condition of the sheep can be maintained; they are always ready when the market is favorable, the wool is of good quality, and the lambing is satisfactory because the ewes have a sufficiency of feed.

Area to Cultivate.—Do not try to crop more land than the strength and means will allow of being properly cultivated. It is better to have a whole crop from half the land than half a crop from the whole of the land; and there is feed on the other half. It does not pay to farm badly.

Fallow.—Do not fallow too early or too late. The best time is after the first heavy rains of winter, then do it as quickly as is possible. Only work the fallow afterwards sufficiently to destroy the weeds, and do not work it too deeply.

Seed Wheat.—From experience he preferred the old varieties—Tuscan, Purple Straw, &c. King's Early is the only early sort he cared for. Marshall's No. 3 seems to withstand rust and yields well in a dry season. Ward's Prolific gave satisfactory results on good land in a fair season. The old varieties can hold their own—withstanding their defects—against all the cross-bred sorts. Whatever varieties are used, they should be sown so as to ripen in rotation, especially if the binder is to be used to harvest the crop.

Pickling.—All grain intended for seed, if liable to bunt, should be pickled with bluestone, and the seed should then be left until dry before being sown.

Oats.—Nothing gives better value in feeding than oats, and Cape oats are preferable, although liable to go down. This difficulty can be lessened by using the binder.

Time to Sow.—April is quite early enough in this district to start sowing, but should be finished by end of May if possible. Begin a little later if early rains have started the weeds.

Drilling.—The main object is to secure an even distribution of seed and manure at an even depth on a firm but not hard seedbed, just sufficiently deep to properly cover the seed and ensure even germination and a more regular ripening than would occur if the seed were broadcasted, besides getting the greatest advantage from the limited quantity of fertiliser generally used. The plan of drilling in small quantities of manure early in the season and afterwards broadcasting the seed has little to recommend it. Less than 1 cwt. of mineral super., or its equivalent in other phosphatic fertilisers, is not sufficient to keep the land in good heart, and 1½ cwt. to 2 cwt. per acre would probably be better. It seems absurd to try and maintain fertility in land with an application of 40 lbs. or 50 lbs. of mineral super. If there is not sufficient rainfall in any locality to grow wheat with the aid of manures there is not enough to grow crops without fertilisers, and the attempt to do so had better be given up.

After-treatment.—On light land, when the crop is sufficiently advanced, give it a rolling and a light harrowing, with a view to conserving the moisture in the soil. On stiff clay land harrow only, if it is not too rough. If the season is very dry and frosty, and the crop backward, do nothing. The less knocking about in such a case the better.

Harvesting and Fodder.—For several years he had cut the bulk of crops with the self-binder, and thrashed with the header, and had no reason to repent doing so. It costs a little more, but the crop can be got in ten to fourteen days earlier, thus reducing the risk of considerable loss through storms and other causes. The wheat is of better color and quality, and, in a crop of fair length, more grain can be secured than could be got with the stripper. In addition, the straw is clean, good, and can either be used as fodder or sold. It is far better, however, to feed the straw and chaff to the stock, instead of impoverishing the land by sending it off the

farm. Sir J. B. Lawes has stated that for every ton of straw consumed on the farm, under proper management, there ought to be a return in the value of the manure produced of 12s. 6d. Perhaps the manure would not be worth so much here, but it is of some value.

Implements.—According to their means, farmers should try to procure the best up-to-date implements. There is no sense in trying to work a three-furrow plough with six horses in sticky soil, when the horses are pulling more dirt than would equal the size of the plough through the ground, when a light five-furrow prong mouldboard plough can be used, requiring only six horses to do more work. The same remarks apply to all implements used on the farm. There can be no satisfaction in working with heavy and noisy implements when better work, and more of it, can be done with lighter forms of modern make.

Indigenous Vegetation.—It is not advisable to destroy too much of the cotton bush and other indigenous forage plants, which are more valuable sometimes than the wheat crops which could be grown in their place.

Ororoo, May 16.

Present—Messrs. W. S. Lillecrapp (chair), F. F. Copley, G. Matthews, M. Opperman, J. Jamieson, R. Coulter, J. Moody, and T. H. P. Tapscott (Hon. Sec.).

POULTRY.—Mr. Jamieson said many people kept too many fowls on the area available, and did not give them sufficient care and food, which resulted in failure through diseases, ticks, and other parasites. He considered iron houses too cold for poultry. Mr. Matthews did not think iron houses too cold, and are easily cleaned; but fowls should be protected against draughts. The leaves of the tree tobacco (*Nicotiana glauca*) are eaten by fowls, and they are kept in good health by them. Mr. Opperman said pie melons are a good substitute for green feed, and fowls are very fond of them. Mr. Coulter favours a portable fowlhouse which can be shifted from one chaff heap to another, or place to place.

Wandearah, May 19.

Present—Messrs. George Robertson (chair), W. Roberts, E. H. Eagle, E. Jacobs, J. Kurl, T. Joyce, A. W. Davidson, W. Munday, W. Halliday, J. Watt, L. Stanley, C. E. Birks (Hon. Sec.), and one visitor.

WHEAT EXPERIMENTS.—Mr. Munday reported on wheats received from Central Bureau. World's Champion, badly rusted, 7ozs. sown on May 11 and manured with super. at rate of 60lbs. per acre, yielded 6lbs. grain. Marshall's Hybrid, sown on May 27, unmanured, 6lbs. 6ozs. sown, yielded 79lbs. grain badly affected by rust. Ranjit, 4lbs. 6ozs. sown May 27 without manure, yielded 60lbs. not rusted, but very weak straw, good grain. Five and one-half pounds Majestic, no manure, yield 80lbs., no rust, good grain, short straw. Silver King, 4lbs. 14ozs. sown yielded 22lbs., short straw, no rust, but crop badly blighted, only two-thirds of it being worth reaping.

STANDARD SAMPLE OF WHEAT.—Members favor permanent standard of 62lbs. per bushel, and not 63lbs., as stated in *May Journal*, page 864.

Kapunda, May 3.

Present—Messrs. W. M. Shannon (chair), R. B. Banyer, J. J. O'Sullivan, G. Teagle, H. T. Morris, H. A. Holthouse, J. H. Pascoe, C. E. Weckert, J. O'Dea, Peter Kerin, and G. Harris (Hon. Sec.).

MAKING FARM LIFE ATTRACTIVE.—Mr. O'Sullivan read a paper on this subject to the following effect:—

Several times I have read in papers letters advising methods of making farm life more attractive, coupled with the complaint that the youth of the country were fast drifting into

the towns. This latter complaint, I believe, is only too well founded. Ask any of them why it is so, and you would find the answer generally that the only thing to be hoped for from farming is a life of hard work, with very little hope of a competency as a result. The farmer has to be out in both heat and cold, with longer days than almost any other workman, so that he cannot be blamed for trying to better his position. The remedy rests in some measure with the farmers themselves in husbanding their own strength, and by so doing make farming more profitable; and anything that will tend to this end is worthy of consideration. There are methods that will go a great way to making the life more attractive; indeed, it is a hard life that is not to be borne where the pay is good. One step, I think, will be unity in agriculture. A union well managed would go far in this direction, and make their life at least as attractive as many other forms. The unity I hope for is not the shadow, but a very sound reality. This union would, if carried out on sound business principles, embrace farming, grazing, and dairying; in fact everything connected with the produce of the land. This union should hold its sales of the various forms of produce for not only shareholders, but for the general public. This latter body would gradually come in as shareholders, as, if worked by a capable management, it should very soon become a profitable investment for the people. I think there are few undertakings capable of greater results than a well-managed union. Unfortunately farmers seem to have no faith in each other, and so go on divided. It is a true saying that unity is strength. This will be granted by most sane people, and yet, I ask, where do you find less unity than among farmers? Again, if we look round, almost every form of trade has its union or combination, and it amounts to this, that the farmer in his relations with trade must pit himself against a combination. Everything he wants has its price fixed, or nearly so, and everything he raises goes into an open market, or commonly has its price fixed by the agent or through his agency. If, instead of requiring you to hold ten shares to become a shareholder in this union anyone taking one paid-up share should be entitled to rank on the list, because it is better to have 10,000 shareholders holding one share each than 1,000 holding ten shares each. The more holders the greater the business done. If farming can be made more profitable the towns will be relieved of most of the trouble and the country will keep its rural population. I do not say this union will be a cure for all our ills, but it would, if properly carried out, very largely help to make farming more profitable than now. Unfortunately you will find many do not like the union because they do not reap immediate profit. Now every undertaking of this sort has at the outset to go to considerable expense in providing the necessary buildings, offices, &c., but when once thoroughly equipped there may be no room for complaint. If nothing is gained, I have always held the opinion that a union with a sound management would greatly assist farmers, and I believe that the time is not far distant when it will become an institution, and by its assistance farming will be very much benefited, with the result that the life will be more attractive. I would like to show the way that many are duped, and just because they take things at a face value. We will suppose the union has an agent in a certain town, and another agent is across the road. The farmer goes to both and finds the union agent is a $\frac{1}{2}$ d. or perhaps 1d. below the other's price. Now, though this looks bad, if I am a shareholder in the union it will still pay me to take the lesser price, because if I consider the matter I will see that the gain of the union is my gain, while the gain of the city merchant is my loss. This is only speaking of our sales in wheat and other produce, but we may take the same view in regard to all our wants, very many of which could be very well supplied by this union, thereby foregoing a further profit for the union and consequently for the farmer. It wants to be clearly understood that everything that benefits a company surely benefits the shareholders. This, I believe, would greatly assist farmers and make the life more attractive. In no form of work is money produced that can be called real gain to the world so truthfully as from agriculture, which is bringing into existence that which was not there before. This produce enriches all, so the more producers the better. This with perfect, or as near perfect as we can get, union for its distribution will leave the farmer a fair share of pay for the work he has done. This unity, I am convinced, must come, as the calls on farming so nearly balance its production that there is too little left him at the close. The consequence is the drifting into the town of the youth who ought to be the reserve that would carry on this production, but he sees only the life-long struggle his father had and determines to try something else. How many each of us can remember who have left the farm and who only tend to aggravate the keenness of the demand for work, and in many cases each trying to outbid the other until the work does no good to the one who gets it. This state of things is, I think, mainly due to bad methods. Farming is still profitable if well and carefully managed. Unity, I believe, is the first step, and the more perfect that unity the more profitable farming will become. This would have the effect of the country keeping its young men, and possibly help by relieving the towns of some of their surplus labor.

The Chairman said this matter was of considerable importance. No doubt to make farming more profitable would make it more attractive. One objection by young people was long hours and hard work. Labor in towns was easier, the hours shorter, and there was not the monotony of the farm. As to people

selling produce to any union for less than they could get elsewhere, it could not be expected. Farmers wanted the best price obtainable and cash straight away. Mr. Holthouse said it seemed natural for people in the country to want to go into the town, and for those in the towns to go to the country. Farmers should pay their sons something for their labor; if they were not paid they could not be expected to remain if they can earn money elsewhere. A man would not sell his wheat through any union for 1d. per bushel less than he could get elsewhere; the present profit would be preferred to the expectation of something in the future. To make farm life successful it was necessary to have the best appliances and to treat the land properly.

Saddleworth, May 9.

Present—Messrs. J. H. Frost (chair), D. H. Adams, W. H. Bee, J. P. Daley, J. H. Echemann, W. Hannaford, F. Plant, F. Pluckhahn, T. H. Neill, J. Scales, F. Coleman (Hon. Sec.), and two visitors.

WHEAT-GROWING CONTEST.—Further prizes of the value of £21 were announced as offered by importers of machinery and manures in connection with the twenty-acre wheat contest.

QUESTIONS AND ANSWERS.—Members favor the suggestion of the Scales Bay Branch that a portion of the *Journal of Agriculture* could usefully be devoted to "Questions and Answers."

READING COURSES.—Mr. Adams suggested that text-books—such as Cousins, Webb & Harrison—are well worthy of being studied by members and consideration at meetings of the Branch.

NEW VARIETIES OF WHEAT.—The Hon. Secretary distributed small packets of twenty-five varieties of wheat, chiefly crossbred, received from Mr. W. Farrer, of New South Wales.

Port Pirie, May 17.

Present—Messrs. T. Johns (chair), E. J. Hector, T. C. Jose, G. M. Wright, T. Gambrell, W. Smith, P. J. Spain, R. J. Ferry, T. Bell, and T. A. Wilson (Hon. Sec.).

POULTRY.—Mr. Bell read a paper on this subject to the following effect:—

He had tried the Partridge Cochins, and, although they were poor layers, he did not think for table purposes they could be beaten when crossed with the Malay, as the progeny make large birds, which mature early. The Orpingtons were good layers for one season, and make good table birds; but he did not consider them as profitable as crosses of Spanish, Minorca, or White Leghorns and Dorkings. Every year fresh blood should be introduced, or the stock will deteriorate. On the farm wheat is the principal food; but a good variety is essential to profitable egg production. Bran is always procurable, and should be used in summer when there is no green food. Provide plenty of pure water, and keep the birds clean. Do not keep more than eighty head of poultry on one run. In the summer of 1899-1900 he had about 250 together. Roup broke out, and he lost one-third before he could stop it. Since then he had kept the flocks divided and had very little disease. The roosters raised on the farm should be eaten or sold as soon as they are fit, as they only consume food for nothing. Do not keep any hens after their second laying season. In order to keep a record of the ages of the fowls he takes off one toenail when the chick is a few days old. From the 1900 chicks the left nail on the left foot may be removed; the 1901 chicks have the middle toenail removed, and so on, a record being kept for guidance. Keep a few hens for setting if an incubator is not used. He found the Light Brahmas about the best for setting. They are quiet, good mothers, and will keep a dozen eggs properly covered. For raising chicks he has an old pine building which is made fowl-proof. In this, twelve to fifteen hens are set at a time, the nest being made on the ground, and the hen put on after dark, and covered with a tub or box for twenty-four hours. Remove the cover at night and you will find very few leave their nests. As to question whether poultry pay, he kept a strict account during three

months of the winter of 1900 of the food consumed and the eggs sold, and found that the return was equal to 20s. to 30s. per bag of clean wheat. This did not take into account the eggs used on the farm. Fowls must be kept warm in winter if a profit is to be made. To do this, and at the same time keep off the tick, is a difficult problem. He strongly advised farmers to pickle the eggs when cheap. He put down about 160 dozen in September and October, when eggs were fetching only 5d. per dozen, and had been getting 1s per dozen lately for these eggs. If everyone pickled eggs when the glut season was on, the prices would be more regular. The cost of preserving eggs did not exceed ¼d. per dozen.

PRESERVING POSTS.—Mr. Hector read extract from paper, which recommended a mixture of boiled oil and coal dust painted on posts to keep away white ants. Members considered it would be too expensive; tar was also too dear to be largely used. Mr. Bell intends trying strong solution of bluestone. Mr. Jose makes a hollow round the post, and puts in a little salt; the rain dissolves this and carries it into the soil, and white ants will not attack the posts. [Try dipping in a solution of 1lb. white arsenic dissolved with 2lbs. washing soda, in 1gall. boiling water.—GEN. SEC.]

Wilson, May 17.

Present—Messrs. W. H. Neal (chair), H. Ward, A. Crossman, W. H. Neal, jun., H. T. Crossman, R. Rowe, T. Barnes, A. Smith (Hon. Sec.), and two visitors.

DISTEMPER.—Discussion took place on treatment for distemper in dogs. The Hon. Secretary suggested lard and gunpowder, also placing Stockholm tar on the dog's nose. Mr. Barnes had used the former treatment with success, and Mr. Rowe the latter without success. Mr. H. T. Crossman had successfully treated dog with milk and gunpowder.

BOILS ON HORSES.—Treatment of horses suffering from boils on the shoulder was asked for. Most members had no experience with this trouble. Mr. A. Crossman found Rowe's embrocation as good as anything. Mr. Rowe bathed the affected parts with warm water for about a fortnight, then lanced the boils and used salt and turpentine to heal the wound.

Naracoorte, May 10.

Present—Messrs. S. Schinckel (chair), A. Johnstone, J. Wynes, W. McKay, J. G. Forster, A. Caldwell, and W. A. Terry (Hon. Sec.).

BOT FLY.—Mr. W. A. Terry read the following from "Veterinary Notes for Horse Owners," 5th edition, 1897, by Capt. Hayes, a veterinary surgeon in the Indian Army, referring to bots in the stomach of the horse:—

Small numbers, as a rule, were productive of little or no ill consequences to their host; if numbers be large they cannot help being a source of debility and irritation. Practically speaking, bots in the stomach require no treatment, for they have as a rule but little hurtful effect on the horse; medicines do not have much power in dislodging them and they pass out at their appointed time. The writer was inclined to think that a course of tartar emetic - 2 drachms in the food for a fortnight—would expel them; if lodged in the rectum an enema of 6ozs. of turpentine and three parts of linseed oil could be used; if inside of the anus, smear round with mercurial ointment; if at the back of the mouth brush them over with eucalyptus oil or a mixture of one part of oil of turpentine and three parts of sweet oil.

MANURING GRASS LAND.—Referring in laudatory terms to a paper published in the May issue of the *Journal* by Mr. W. L. Summers, Mr. Johnstone said it would be necessary to disturb the soil, else a lot of the fertiliser would go to waste. He recommended brushed harrows, and thought the dry box thorn is best for brushing. The Chairman agreed, and recommended running light harrows over grass lands before the late autumn rains for improvement of the pasture.

Richman's Creek, May 19.

Present—Messrs. W. Freebairn (chair), A. Knauerhase, J. M. Kelly, J. J. Gebert, E. Roberts, J. H. Lehmann, W. G. Wright, F. Mattner, J. McSkimming, J. A. Knox, and J. McColl (Hon. Sec.).

WILD DOGS.—Mr. Lehmann said dingoes had destroyed many of his sheep recently. He had erected a wire-net enclosure 3ft. 6in. high, but this was only a temporary check; then he added 2ft. more of wire-netting, and they got over that. There was a barb wire on top, and in climbing over they sometimes left a bit of skin on it, which showed the color of the dog. He proposed adding 2ft. more of netting, making 7ft. Crows and eagles were also destructive to lambs, and he had tried strychnine without success. He is desirous that members of Branches who have had experience will state what is the best fence to keep out dogs.

EXHIBITS.—Mr. Mattner tabled a piemelon grown on his fallow and weighing 31lbs. Mr. Gebert showed large cabbages from seed sown in November. Mr. J. McColl distributed three varieties of tomato seed from the State Farm in Western Australia.

Mount Pleasant, May 9.

Present—Messrs. G. Phillis (chair), F. Thomson, P. Miller, jun., J. F. Miller, E. Miller, W. Liddon, H. Drogemüller, J. A. Naismith, J. Maxwell, G. A. Vigar, V. Tapscott, and H. A. Giles (Hon. Sec.).

"PRACTICAL FARMING FOR HILLS DISTRICT."—Mr. G. A. Vigar read a paper to the following effect:—

"Practical farming" means using the natural characteristics of a farm to the greatest advantage and adopting as many items of produce as money and experience will permit within the limits of profit. It does not pay to have all the eggs in one basket. Cereals, wool, and dairying will for years remain staple products; but there is a nice little sum to be made out of pigs, poultry, bees, and garden, even when labor has to be paid for. The soil differs so greatly all over the district, from stiff clay to washed sand, that it is not possible to fix upon what are the best varieties of cereal to grow in all places; but it is always advisable to plough well, and make 9in. furrows in preference to 12in. or more. It will pay to use a drill and purchase fertilisers suited to the nature of the soil. As to sheep, the best is that which, when handled, will fill the hand, when shorn fill the bale, and when sold fill the pocket. It is absolutely necessary to carefully select the best-framed and best-woolled ewes, and best rams to improve or even maintain the standard in the flock. It is beyond dispute that any improved animals or plants left to themselves will quickly degenerate. The dairy herds in this district have improved greatly during late years, and this improvement is still being pursued. More summer feed is now being cultivated for the cows, and shelters against winter cold and summer heat are being provided. [Rugging in winter at night is also profitable.—GEN. SEC.] By this means he secures a regular supply of milk, and a big heap of manure is collected for the next crop of summer fodder. He keeps a record of each cow's milk, and found a surprising difference between two sister cows, both fed and treated alike. Both calved the same week, one cow 4 years old and the other 5. At the end of six months one had given 335galls. of milk and the other 205galls., a difference of 130galls. Until the test was made the difference was not suspected. Pigs have paid well of late; but, even should prices become lower, it should pay to keep some. At present prices for wheat it will pay better to feed it to pigs than to sell to the millers. The cross between Berkshire and Essex is to be preferred, because the pigs grow fast and do well upon less food than the pure Berkshire, nor are they so greasy as the pure Essex when fattened up. Poultry afford a substantial source of income, which tends to reduce the store bill. For six months he got 580 dozen of eggs from common barn-door hens, but keeps pure-bred roosters of Orpington, Wyandotte, Leghorn, and Dorking breeds. They pay well for the grain eaten and the care bestowed on them. Every farmer ought to grow enough of fruit and vegetables to supply his own home. In the hills district, at least, nearly every farm includes a spot where water can be used to irrigate a small patch for this purpose. By utilising all the natural advantages of his locality, by devoting close attention to every detail, by adding his whole strength to the work of the farm, the practical man can gather the wherewithal to make both ends to meet, and put a little aside for a rainy day.

Lipson, May 17.

Present—Messrs. S. F. Potter (chair), E. D. Swaffer, H. Brougham, C. Provis, G. Provis, G. Carr, E. Thorpe, J. McCallum, E. J. Barraud (Hon. Sec.), and one visitor.

LIVE STOCK SHOW.—An endeavor to be made to hold a live stock show in conjunction with Port Lincoln and Boothby Branches.

F.A.Q. WHEAT STANDARD.—Most of the members agreed upon the necessity for the Chamber of Commerce to fix the standard of fair average quality each season; but think that a fixed selling standard should be adopted. When the weight does not reach that standard it should be subject to be docked, on the principle that was adopted by the Farmers' Union previous to the present season, viz., deduct 1lb. from the weight of each bushel for every pound under the standard. The present practice is very unfair; because, when wheat is selling at 2s. 6d. per bushel, the value of 2lbs. of wheat is deducted for every pound under standard; but, when wheat is selling at 5s. per bushel, the value of 1lb. only is deducted for each pound under standard.

Scales Bay, May 17.

Present—Messrs. A. Newbold (chair), G. H. Newbold, R. S. Thomas, W. J. Thomas, D. P. Thomas (Hon. Sec.), and two visitors.

BUNT.—After discussion, members arrived at the opinion that shrivelled wheat is no more liable than sound wheat to be affected by bunt.

SUPERPHOSPHATE.—Members wish to learn whether the continued use of super. will impoverish the soil; and, if so, is it advisable to use also nitrogenous and potassic fertilisers. [In most soils where wheat is grown here, there is at present a deficiency of phosphates in a soluble or available condition; but, at present, in many places, there is a sufficiency of potash and nitrogen. By adding phosphates to the soil it is made capable of yielding larger crops of grain; but, in time, the supplies of potash and nitrogen may be reduced sufficiently to affect the capability of the soil to yield maximum crops, and then it will be necessary to supply the deficient nitrogen and potash. In the meantime small test plots can always be treated with either fertiliser, or both, or all, and the resulting crops will answer the question practically.—GEN. SEC.]

GROWING FEED FOR STOCK.—All present were agreed that it is necessary to keep all live stock well fed at all times, and that provision should be made for this by the cultivation of a fair area of land for hay and other forage.

Cradock, May 17.

Present—Messrs. R. Ruddoch (chair), P. Gillick, W. Haggerty, J. Paterson, J. Turner, T. Marsh, R. Solly, W. J. Glasson, J. H. Lindo (Hon. Sec.), and one visitor.

OFFICERS.—The Chairman and Hon. Secretary were thanked for their services and re-elected for ensuing year.

CASTRATING COLTS.—The Hon. Secretary called attention to report of Mount Bryan Branch in April *Journal*, in which Mr. Pohlner is reported to have said in his paper "be extremely careful not to cut through the inner lining of the purse." There must be some mistake here. [The last word of the sentence should have been "testicle," not "purse."—GEN. SEC.]

STOCK COMPLAINTS.—The Chairman stated that for several months an aged mare of his had been suffering from a sore in the eye; it started in the inner

corner, and had spread over the eye. At first the discharge was matter, but now it was bloody. Mr. Glasson said he had a mare similarly affected for about three years; the eye shrivelled up, but otherwise the horse was now quite healthy. Cancer was suggested as the cause, and members would like to know whether the symptoms described by the Chairman indicated this complaint. [Symptoms suggest possibility of cancer. In any case, it is probable the eye will be destroyed. The Chief Inspector of Stock suggests removal of eye and frequent dressing of wound with weak carbolic and water.—GEN. SEC.]

Port Broughton, May 19.

Present—Messrs. W. R. Whittaker (chair), E. Dalby, W. Dalby, E. Gardener, E. Dennis, J. Harford, and J. Barclay (Hon. Sec.).

QUESTION BOX.—A number of questions were asked and some interesting discussions took place. The best depth to sow wheat was generally considered to be 2in. The cost of converting hay to chaff was put at 8s. to 10s. per ton, and it was considered profitable to chaff the hay on the farm, as chaff was economical in labor, time, and food, compared to hay. The question of fallowing near the fences and causing the land to drift across the roads, also of sowing oats on the fallow to prevent drift, were dealt with, but decision postponed until next meeting. Two questions concerning the best way to make the Bureau more useful, and the value or otherwise of the Bureau were also postponed.

Lyndoch, May 20.

Present—Messrs. H. Kennedy (chair), R. Ross, J. M. Sim, P. Zimmerman, J. W. Thomas, W. J. Springbett, H. Springbett, F. K. Warren, and J. Mitchell (Hon. Sec.).

VINE PRUNING.—Professor Perkins agreed to visit the district and give demonstrations in pruning vines on June 19.

CODLIN MOTH.—Delegates reported on result of meeting of delegates from Lyndoch, Tanunda, and Angaston Branches to consider this question. The meeting suggested the carrying out of spraying tests in each locality, also a joint meeting of the three Branches to consider the whole question.

Caltowie, May 21.

Present—Messrs. J. Leahy (chair), J. Neate, C. Jettner, A. Kerr, P. Petatz, N. Hewett, J. Potter, A. McCallum, L. Graham, F. Lehmann (Hon. Sec.), and three visitors.

IMPACTION IN CATTLE.—Mr. Neate reported heavy losses from this trouble. At the end of January he shifted his cattle on to stubble paddock in which there was plenty of green wireweed, and they received well water instead of dam water. Within a few days one showed signs of disease, and died two days later; another cow soon followed. On opening these he found the omasum very hard and packed with dry substances, and when parted the lining of the omasum came away with it. A third beast (a steer) died, and the omasum was loose but quite decayed, coming away with the lining when handled. He commenced giving opening medicine and bran mash, also feeding brar and chaff, besides securing a reputed certain cure from a man on the Peninsula, which, however, seemed to him to be merely condition powders. His losses

still continued, and in three months only five animals were left out of eighteen. As a rule the affected animals run freely at the mouth. His experience was that once the animals get really bad there was no hope of saving them. Mr. Kerr was convinced that the trouble was due to poisonous plants and not to impaction. He had lost a number of sheep from same cause.

ABNORMAL GROWTH.—Mr. Neate exhibited curious freak in the shape of a lamb (or two lambs) with two bodies and only one head, which was unusually large. Both bodies were perfectly developed; one portion died before the other. The mother died, and on being opened one large kidney only in the centre of the back was found.

LARGE PEAR.—The Hon. Secretary tabled a pear weighing over 2lbs.; it was 6in. across at the wide end.

Stansbury, May 10.

Present—Messrs. A. Anderson (chair), P. Anderson, J. Antonio, C. Faulkner, J. Henderson, H. C. Pitt, J. Sherriff, and P. Cornish (Hon. Sec.).

BURNING STABLE MANURE.—Mr. P. Anderson stated that a neighbor has for many years carted stable manure on to his land and burnt it. He would like to know if anything is to be gained by this practice; was the potash in the burnt manure better than that in the unburnt? [I should characterise this as a very wasteful practice. By burning, all the organic matter is destroyed, and much of the manurial value lost. The potash in the ashes may be more readily available than the potash in the manure.—GEN. SEC.]

SMUTTY HAY OR WHEAT FOR FEED.—Several members stated that they found wheat or hay from a crop affected by bunt was all right for feed; horses seem to like it, and do well on it. The Chairman said all farmers might not be aware of the fact that bluestone could be dissolved in cold water if placed in a bag or cloth and suspended in the water, keeping it near the top of the tub or barrel.

SELF-SUCKING COW.—The Chairman asked for best cure or treatment for cow that sucks herself. [Fix a cradle on her neck.—GEN. SEC.]

PRUNING AND PLOUGHING MATCHES.—It was decided to hold vine pruning and ploughing contests in Mr. H. C. Pitts' vineyard during the first week in July. Adelaide firms will be asked to show orchard and vineyard cultivators and other implements.

Nantawarra, May 12.

Present—Messrs. Jas. Nicholls (chair), R. Nicholls, J. Dixon, G. Belling, E. J. Herbert, A. F. Herbert, S. Sleep, R. Uppill, A. L. Greenshields, A. J. Spencer (Hon. Sec.), and seven visitors.

STANDARD SAMPLE.—Members consider the method of arriving at the f.a.q. sample of each season's wheat harvest as being very peculiar, judging from the wording of the circular forwarded to the Branch when asking for the samples of wheat.

ROTATION OF CEREAL CROPS.—Mr. James Nicholls read the following:—

No doubt the system of farming now generally adopted of one year grass and one year fallow has much to commend it, especially in those districts where the rainfall is limited, as experience has shown that a crop on land that has been fallowed early withstands a dry spring and hot weather much better than a crop on land that has not been so treated, and if wheat alone is to be grown, it would perhaps be difficult to improve on the system; still, in view of the price we have obtained for this cereal during the past few years, would it not be wise to consider whether it would not pay us to extend the acreage under other crops which, considering their yield and relative value, give a higher return per acre. I

do not wish to argue, or even suggest, that anything should take the place of wheat as the principal crop, but by growing other crops to some extent we should not be impoverishing the land for wheat-growing, but, in some cases, actually improving it, and should to some extent be more independent of the wheat crop. As to what crops can be grown with a rainfall of 15in. or 16in., I would name first oats and barley, both of which have been grown to a small extent in this district for some years, and, as a rule, either of these give a one-third higher yield per acre than wheat, that is, when grown under the same conditions as to cultivation, &c. On looking up the market quotations for the year 1901, as given in the *Journal of Agriculture*, I find that for that year the average price of wheat was 2s. 9d. per bushel; Algerian oats, 2s.; white oats, 3s.; malting barley, 3s. 4d.; Cape barley, 2s. 2d. Now, taking a 12bush. crop of wheat as the standard, the monetary returns per acre from the cereals mentioned would be as follows (that is, if we take it for granted that oats and barley give a one-third higher yield than wheat, and from our own experience we know that we are safe in so doing):—Wheat, 33s. per acre; Algerian oats, 36s.; white oats, 54s.; malting barley, 60s.; Cape barley, 39s. per acre. In each case the return is higher than that from wheat. There is also another side to the question. I have noticed, and others have noticed, when a crop of oats has been grown on a piece of land on which the previous wheat crop had been badly affected by takeall, that the succeeding wheat crop was not nearly so badly affected, and is, in fact, much better than it probably would have been had the crop of oats not been grown. This is one of those cases previously mentioned where the land, instead of being impoverished, is improved for wheat-growing. Oats, like wheat, do much better on land that has been fallowed, but a good crop of oats, particularly Algerian, may be grown the year following a wheat crop, especially where fertilisers have been applied to the latter. By cropping a portion of our land with barley we not only provide a straw of which stock are very fond, but the following year the self-sown plants come away very quickly after the first rains, providing early feed for the ewes and lambs at a time when it is most needed, and a variety of fodder is beneficial to stock of all kinds. As both oats and barley can be harvested with the ordinary wheat-harvesting machinery, there would be no extra expense entailed. Now that we have interstate free trade, a satisfactory method of compressing fodder, and ocean steamers of large carrying capacity carrying same to different parts of the world at much lower rates than formerly, the growth of hay is worthy of more attention than when, owing to various circumstances, the demand was only a local one. My object in writing this short paper is to lead us to consider whether it is not advisable to grow something besides wheat, not necessarily less of the latter; but it may sometimes happen that if one fails the other may succeed.

Members considered one-third higher yield of oats and barley rather a low estimate. The small areas of oats and barley grown pay well at present prices. Many cases were given where good crops of oats had been grown on fields where the previous crop of wheat had been seriously affected by "takeall." Good crops of Algerian oats, sown early, have been secured after wheat crops without too much expense. It was shown that oats could be more generally used to feed horses if the present prices should not be maintained, in place of using bran and crushed wheat; and barley could be used for feeding pigs. The benefit to land from growing peas was also alluded to by several members.

Inkerman, May 20.

Present—Messrs. Wm. Fraser (chair), R. Kennedy, J. Sampson, F. C. Smart, W. W. Mugford, C. H. Daniel, W. Board, W. A. Hewett, J. Lomman, and C. E. Daniel (Hon. Sec.).

SEEDING.—Mr. W. W. Mugford read a paper to the following effect:—

In connection with seeding the most important part is the preparation of the soil, and the land must be fallowed early—the earlier the better. The soil is more easily worked before the weeds and grass become firmly rooted. The horses must be well fed for this hard work, as the natural grass, &c., is not good or sufficiently abundant. If the land has a good bottom it should be ploughed about 4in. deep, and be well worked to destroy all weeds, else they will take a lot of moisture out of the ground, and make the field dirty for the following crop if allowed to go to seed. Sheep do good work in keeping down rubbish missed by the cultivator. Light scrub lands should not be ploughed deeply, nor worked afterwards—just harrow it down and let the sheep do the rest. If rain is not late it is best to let the weeds come up before sowing seed. The spring-tooth cultivator is a

handy implement to work in front of the seed and manure drill. That one with twenty-two tines and narrow shares is to be preferred, as it works with less draught than that with larger shares; it cuts the weeds and pulverises the soil more effectually and makes better work for the drill to follow. Unless the soil is left too ridgy there is no need to harrow after the cultivator. If too ridgy use the harrow, because some of the seed may be buried too deeply, whilst some may be left uncovered. When the field has been cultivated get the drill to work at once, as the seed will be covered better before rain comes to settle the surface down. Seed should be only deep enough to bury it. The hoe drill seems to be the best when the ground is clean. If the soil is wet and the seed not well buried it will pay to harrow after the drill. A little over ½ bush. of seed of the late varieties, if sown early, is enough for an acre. Of the early varieties about a bushel per acre is enough, with 50 lbs. super. Poor land may require more seed, because it does not stool as well as on good soil. Stubble land, if clean, will produce a better crop than will be got off the land just broken up, because such land seems to lie hollow; and, although the crop does well for a time, it is most likely to fail later in the season.

Whilst agreeing with most of the arguments in the paper, members differed in respect to heavier seeding on poor land. Some of them would only use 4 bush. on nine acres, and others only a bag to eleven acres. All were agreed that sandhills should never be fallowed, else they would ruin homes and roads.

SOFT SHOULDERS.—To harden tender shoulders on horses Mr. Board recommended washing with salt and water, and Mr. Smart said he had successfully used a bag which had contained superphosphate.

Davenport, May 16.

Present—Messrs. T. McDowell (chair), W. Hodshon, sen., D. J. Brown, A. McDonald, F. H. Pybus, W. G. Pryor, T. Trotteman, J. Holdsworth, W. J. Trembath, and J. E. Lecky (Hon. Sec.).

EXHIBITS.—By W. G. Pryor, box of excellent Muscatel raisins; by T. McDowell—large Henderson's Succession cabbage; by F. H. Pybus—grapes kept for ten weeks in fire-dried sawdust and salt, but spoiled.

"BLOCKS AND BLOCKERS."—Mr. W. G. Pryor read a very lengthy paper. The following is a digest.—

The original idea in the homestead blocks system was to enable laboring men to have a home and a moderate block of land, under a perpetual lease, where he could occupy his leisure and periods when he was out of employment in rearing a few vegetables and fruits, keeping a cow, a few fowls, &c., and thus to keep him from idling his time at street corners or elsewhere. It was argued that there was no encouragement to improve a rented property from whence he might have to remove, or to have his rent raised in proportion to the improvements he may have made. In time a mischievous innovation crept in, whereby right of purchase of a much larger area was granted, sufficient in some districts to induce many to throw up their employment in the hope of making a living off the block alone. In some districts they might have been successful, but in very many cases the experiment has resulted in failure. There is nothing to prevent blockers buying their holdings and selling to others, or to speculators. The original idea was that no man should hold more than one block to the exclusion of others. The system was expected to be a great success, but it has proved to be a ghastly failure in the neighborhood of Port Augusta. Instead of comfortable homes surrounded by little plots of gardens, there are drifting sand wastes, desolation, and deserted homes. Some people attribute this to drought, bad seasons, and scarcity of water; but he laid the ruin to the fact that men took up the blocks expecting to make a living off them, and did not consider whether they could compete profitably with others far more favorably situated. The first thought was to destroy the original natural bush and herbage, and more of this done within a given time the greater the hope of success. Then came the rush of planting trees, vines, lucern, and vegetables by the acre, and without considering whether they could be grown profitably or not, or whether the soil and climate were suitable, or the cost of supplying water would justify its use. The whole time of the blocker was spent on the block trying to do impossibilities. What could result but failure, loss, and disappointment? In place of being a blessing the block has been the means of many a man losing his hard-earned savings, and he has been compelled to throw up his block in disgust, blaming seasons,

waterworks charges, bad luck, and everything except his own bad judgment. One or two blocks near Port Augusta have been fairly successful, but in one case the block can be flooded with nearly every rain from the creeks and roads, and the owner has not yet attempted too much in the way of planting. The other block is occupied by a practical gardener who has facilities for disposal of his produce to the best advantage. On both these holdings a considerable portion has been devoted to hay, but the destruction of the natural bushes has favored the drifting of the sand, and most of the surface has drifted on to the neighbor's garden; whilst the neighbor's wheat paddock has drifted on to the road. In order that these blocks may be usefully reoccupied it is necessary that the occupiers should place no dependence on them for making a living. The living must be made elsewhere, but a comfortable home, tending to make life pleasanter and brighter for the man and his wife and family, can be made, even on the sandhills in and around Port Augusta, if the right lines are followed. Almost any site is suitable for occupation, if it is not a gravel bed; but water must be laid on, and, if there is any possibility of securing water from adjacent roads when rain falls, this also should be utilised to the last drop. The house should not be on top of a hill, but on the sandy flat, with clay at, say, 2ft. to 3ft. from the surface. At first a very small plot around the house should be securely fenced, to prevent trespass by fowls, the pig, or the cow. The whole of the block should be fenced as soon as time and funds will permit, but not a single bush should be destroyed if it can possibly be avoided, and no attempt should be made to grow hay or break up the natural surface of the ground outside the small enclosure. Two or three Zante vines and as many muscatels could be planted on either side of the house, and a few table grapes alongside the path in the little garden in time might supply currants, raisins, and grapes for the house. A couple each of peach, apricot, mulberry, orange, and lemon trees might also be planted, and a few vegetables for home use. Outside employment must be relied upon to maintain the family, and the block must be regarded simply as an auxiliary, contributing to the comfort and pleasure of home.

Carrieton, May 22.

Present—Messrs. W. J. Gleeson (chair), M. Manning, A. Steinke, F. Kaerger, F. Vater, J. Crogan, O. Hall, D. Davies, and J. W. Bock (Hon. Sec.).

STARVING STOCK.—The Hon. Secretary called attention to the fact that herbage of all kinds is very scarce, and hay and chaff too dear for feeding stock. Mr. A. Steinke said porcupine grass (*Triodia irritans*) if chaffed and boiled in a 200-gallon tank becomes soft, and when mixed with chaffed hay makes good food for cattle and horses. Mr. Hall said when a farmer has plenty of straw he need not fear for his stock, as they will hold out on that until grass is available. Mr. Gleeson cuts porcupine grass close to the ground, chaffs it, mixes a little pollard with the chaff, and the stock do well.

GREEN FEED FOR FOWLS.—Mr. Bock wanted to learn what substitute could be given to fowls in the absence of green feed, and was recommended to try chaff scalded and mixed with pollard. [Soak barley or other cereal, spread on a floor, cover with sacks to exclude light. The grain will soon germinate; then expose to light, and the green stuff can be given to the fowls in moderation.—GEN. SEC.]

FOWL TICK.—Mr. J. Cogan showed sketch of a tick-proof poultry house recently erected by himself.

SMALL HOLDINGS IN THE NORTH.—Mr. J. Crogan read a paper to the following effect:—

There is no doubt that the majority of holdings are too small in the dry country north of "Goyder's Rainfall Line," and it is necessary to devise some scheme for removing the smaller holders to a district with more reliable rainfall, and to increase the holdings of those who stay, so that they may combine grazing with cultivation. The years of drought have had a disastrous effect on the indigenous vegetation, and it will take years with good rainfall to restore original conditions. He had noticed some land which had been left out of cultivation for eight years, but was cropped last year with favorable results, whilst adjoining land that had been fallowed every other year produced crops that were almost failures. The position is this:—The small holder is unable to leave, because he cannot find a buyer, whilst the larger holder has not the means to purchase. Ultimately the small holder must go; but the

question is, where can he go to? Many have tried to get land elsewhere, and have failed to do so. Whilst they remain they have at least a roof over their heads. He suggested that when a small farmer wants to sell out to another, the State should first take it at a price, and give him a prior claim to a "closer-settlement block," and credit him with the amount of sale as "rent paid up." Then give the other (the real purchaser) forty-two years to pay up—or on the same lines as loans by the State Bank. In the event of the purchaser bringing the land under the Pastoral Act, the purchaser should be credited with all moneys paid in excess of pastoral rent from the time it was first taken up. It is simply a matter of exchange, and would be the means of retaining our population, with benefit to both those who left the locality and those who stayed on the land.

Members agreed with the ideas expressed in the paper, and hoped that the matter will be considered by other Branches.

Amyton, May 22.

Present—Messrs. S. Thomas (chair), W. Mills, W. Gum, A. Gray, G. Wheadon, W. Hughes, Thos. Gum, R. Brown, John Kelly, F. Mallett (Hon. Sec.), and one visitor.

CHERRY-TREE NOT BEARING.—Mr. W. Gum stated although his cherry-tree blossomed freely the fruit all fell when they should be setting. There was only one cherry-tree in his garden, and no other within six miles. The Hon. Secretary suggested that the flowers required the pollen from another tree to properly fertilise them. [The locality is quite unsuitable for growth of cherries.—GEN. SEC.]

PROSPECTS OF AGRICULTURE.—Discussion took place on paper read at previous meeting. It was thought that casual labor leaving the agricultural districts was regrettable, but only what was to be expected from the seasons experienced of late, being simply the result of the laws of supply and demand, and that with the return of better seasons circumstances would quickly provide a remedy by a flow of labor from various precarious employments.

Port Germein, May 24.

Present—Messrs. G. Stone (chair), W. Mortess, A. H. Thomas, W. Head, H. Kingcome, J. R. Gluyas, E. G. Bleising, and G. F. Steinthal (Hon. Sec.).

AGRICULTURAL BUREAU.—The Chairman referred to report in daily press indicating the possibility of the Bureau being abolished. It was unanimously resolved that this Branch deeply regrets that the Government have seen fit to include in their policy of retrenchment the abolition of the Agricultural Bureau, as such a course would be detrimental to all agriculturists and to the best interests of the State.

HARVESTING WHEAT CROPS.—Mr. J. R. Gluyas read a paper on "The most Profitable Way of Harvesting the Crops in this District."

This subject is one of considerable importance to the wheatgrower, and especially to those who wish to get the best possible returns from their fields. It has been my lot during the last fifteen years to see a great amount of waste, through crops having been broken down by wind and rain, and then the strippers put on to take it off, with the result, at times, that half or two-thirds of the grain is left behind. In the harvest of 1889, my brother and I were reaping off with the strippers a crop that had gone down so badly that we were taking off 5bush. per acre, and leaving 20bush. behind. This was before the reaper and binder came into use in this district; in fact, there was a prejudice against this wonderful machine, that it was not a desirable implement to have on the farm; but what is the result to-day? We find it the best paying machine we have. I have often noticed after a crop which has been broken down has been stripped it seems to be taken off fairly clean, but on closer examination it would surprise anyone to see the amount of grain that is left behind, evidently flattened down by the horses' feet, and by the wheels of the machines. I also feel convinced

that the farmer who wishes to have the best results from his crop, if it has gone down, is to reap it with the string binder and have it thrashed. In advocating more use should be made of the string binder, I cannot see that it is possible, in a dry district like this, to do away with the stripper altogether. In dealing with a wheat crop of say 400 acres, I deem it advisable to have two binders and two strippers to take it off. When the weather is hot and dry have the strippers at work, and when the weather is cool and the straw tough use the binders. I do not advocate working the binder in hot weather, as a lot of grain would be knocked out by the reel. I know there are a number of farmers who object to the expense incurred in handling and threshing the sheaves; but I contend that taking into consideration the saving of straw—and most of us know that a good stack of straw has come in very acceptable for the cattle during the last few years—the extra expense incurred in handling and threshing the sheaves is well repaid, and the yield is also better than that taken off with the stripper. Some delay and inconvenience was caused this last season by those who had stacks to thrash, the Telowie and Baroota Steam Threshing Co.'s plant hardly being available, owing to the small amount that was cut for threshing; but there is no doubt if a good number of stacks were cut for the thrasher the company would be prepared to treat it at 3d. per bushel. I, therefore, think the most profitable way of harvesting the crops in this district is to work both the binder and the stripper.

Most of the members present agreed with the opinions expressed in the paper.

Meadows, May 19.

Present—Messrs. J. Catt (chair), T. B. Brooks, T. A. Buttery, G. Ellis, W. J. Stone, W. Nicolle, A. Stevens, D. D. Murphy (Hon. Sec.), and three visitors.

CEREAL GROWING.—Discussion took place on best time to plant cereals, and quantity of manure to use. It was generally agreed that it was advisable to sow early. Mr. Stevens said his experience was that taking 2cwt. of bone-dust per acre as a standard dressing for peas, the addition of an extra hundred-weight gave a greater profit than the first dressing, the crop of peas being heavier, and a very much better crop of hay being secured the following season.

Renmark, May 22.

Present :—Mr. E. Taylor (chair), several members, and twenty visitors.

ZANTE CURRANT GROWING.—Mr. W. H. Harrison read the following :—

After dealing shortly with the historical and commercial portion of the subject, he remarked that very little about currant growing was known in Australia, but that the Greeks knew all about it. Compared with the currant, the Sultana was easy to understand. When he first came to Renmark he knew nothing about it either, but he had since made these vines his special study. When he came to Renmark the vineyard at the Crescent (then belonging to Chaffey Brothers) was the principal one here, and he noticed on those vines a great number of shrivelled bunches, which most people attributed to the hot winds. Nine years ago he saw the same thing at Mildura. He did not consider at first that it was altogether the hot winds, and thought he would experiment with fifty vines. He planted some 21ft. apart and some 15ft. apart, with 12ft. between the rows. In carefully watching these vines he came to the conclusion that the cause of the shrivelling was the unequal balance in the rise and fall of sap. He tried root-pruning and checking the flow of sap by ties round the rods. The root-pruning was no good, and the tying not satisfactory. He tried tying with wire, but the wire had to be loosened after the fruit was set. Then he tied them with thread, expecting it to break when it had done its work, but some did and others got embedded in the rod. The objection to the wire was that it cut into the shoot. Some cut a wedge out of the base of the vine, but he thought this would shorten the life of the vine. When he was in England two years ago he met a London fruit merchant who had been in Greece, and he told him about the way the Greeks ring-barked their vines, and he determined when he got back to Renmark to try it. He had done so, and was convinced that ring-barking or "cincturing" them was the most satisfactory to prevent the shrivelling of the bunches. The cincturing had to be done judiciously, and just before the buds were about to burst into blossom. Out of a rampant vine he would take a strip of bark half an inch wide all round. Even two-year-old vines

would bear cincturing, but he would not always advise it. Mr. Cooper, of Tarcoola Street, had treated thirty-six vines under his direction. They were three or four years old, and showed very good results. Mr. H. N. Russell had treated Mr. Gosling's currants in the same manner, and he had a good crop. That cincturing the vines did not injure them was proved by the fact that every year a new bark grew over the place, and could be cut in the same place next season. One of his vines had been injured by a cart wheel, and as he did not think it was much good he completely stripped the bark off for 15in., and three or four days after new bark was formed, and after it put forth a shoot 9ft. long. For a small injured vine that was surprising. He had always been of opinion that the currant, being a long-rod variety, should only be pruned on the long-rod system; but he had spur-pruned eight vines, and all these had an exceptionally heavy crop of first-rate quality—124lbs. from vines on the hardest soil. He saw no reason why with this method that on ordinary soil two tons of currants per acre could not be obtained, and on the deep loamy soil of the 60ft. - channel three to four tons. If the vines had been made to bear too heavily one year, and they showed signs of distress, the following year they should not be allowed to bear so much. He did not approve of Mr. Hardy's method of trellising, it was too expensive. Posts, 24ft. apart, and two wires with two intermediate supports were quite good enough. He recommended this experiment to some of the young settlers—Let them select a shoot on a vine, the bunches of which have the least seeds in them, and grow cuttings from the shoot. When they begin to bear select and proceed in the same manner, and in, perhaps, thirty years they may get a seedless Muscat. To sum up the requirements of the Zante were as follow:—Depth of soil, plenty of room—he had better results from vines when planted 21ft. apart than those 15ft.; high sandy loam was the most suitable in Renmark; spur-pruning was the best on a large scale; and judicious cincturing as the best means of setting the fruit. There was not so much to be feared from hot winds if the fruit was properly set, and then there was no need for early gathering. These conditions being provided they should get a paying crop the fourth year, and about the seventh or eighth from two to three tons per acre. He had never seen Zantes cut up with the frost, but Sultanas he had seen. When the vines were blossoming they must not water freely.

Dowlingville, May 16.

Present—Messrs J. Phelps (chair), T. Illman, R. A. Montgomery, G. Mason, W. T. Holland, and F. Loch (Hon. Sec.).

FARMERS' FRIENDS.—Mr. T. Illman dealt with "Some of the Farmers' Friends," chiefly paint and grease. Very often implements are much neglected in regard to oil and paint. An implement that has been properly dealt with in these respects will keep in better condition, even if left out in the open air, than an unpainted and unoiled implement would do in a shed, where the moist air penetrates the wood or interstices of the iron and causes decay and rust. Grease or oil in the axles and spindles or bearings make them work easy, save wear, and minimise labor. It is advisable to mix a little Stockholm tar with the oil or grease. It is not enough to grease the working parts of a stripper or similar implement twice a day, as the bearings suffer when they begin to get dry. "Little and often" should be the rule. Members agreed with the writer; one considered the draughts in an open shed to be more injurious than exposure in the field—sheds should be enclosed.

THE F.A.Q. SAMPLE.—Members desire that the Chamber of Commerce will fix the standard of f.a.q. wheat for the northern parts at an earlier date, because much of the season's crop in parts of the North is sold before the standard for the season has been fixed. They also think a permanent standard weight for selling should be fixed, and allowance to be made for any wheat weighing above the standard, and deduction for any below.



INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

Number of Persons Registered and Found Employment by Government Departments and Private Employers from April 28 to May 28, 1902.

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youths	134	95	196
Masons and bricklayers	1	2	6
Plasterers	1	1	1
Stonecutters	—	—	2
Carpenters	10	—	9
Painters	4	3	—
Fitters and turners	—	1	3
Enginedrivers and firemen	1	—	—
Boilermakers and assistants	1	—	1
Blacksmiths and strikers	3	1	—
Moulders	2	—	—
Plumbers and ironworkers	1	—	1
Patternmakers	1	—	—
Shipwright	—	1	—
Porters and junior porters	6	5	1
Cleaners	5	3	—
Apprentices	17	4	2
Rivet boys	4	—	—
Totals	191	116	222

May 28, 1902.

A. RICHARDSON, Bureau Clerk.



Journal of Agriculture

AND

Industry.

[REGISTERED AT THE GENERAL POST OFFICE, ADELAIDE, FOR TRANSMISSION BY POST AS A NEWSPAPER.]

No. 12.

JULY 1, 1902.

VOL. V.

NOTES AND COMMENTS.

The weather during June was a marked improvement over the previous months. Over the whole of the Lower North and Southern districts for nearly three weeks some splendid soaking rains fell. In the far northern wheat areas the rain was much lighter, and although generally sufficient to give the crops a start, it requires a thorough soaking rain to relieve the anxiety of the tillers of the soil in this part of the State. The lateness of the rains has naturally caused the grass to be backward, and unless we experience unusually favorable weather during the next month it is hardly likely that there will be much pasturage except in the more favored districts. The drought still continues over the bulk of the pastoral areas, and disheartening tales of losses of stock are frequent. It will take several favorable seasons to make up the losses of the past few years.

The current issue completes the fifth year of issue of the *Journal of Agriculture and Industry*, and with the new volume there will be a change in the management. The present editor has endeavored during his term of office to make the *Journal* as valuable and reliable as possible, and although working under difficulties owing to the very few regular contributors, believes that a fair measure of success can justly be claimed. The proposed reorganisation of the Department of Agriculture involves rearrangements in connection with the *Journal*. Professor A. J. Perkins, Secretary for Agriculture and Government Viticulturist, will be the new editor, and Mr. W. L. Summers, Inspector of Fertilisers, will be sub-editor. It is satisfactory to learn that the Government intends to do all in its power to foster the work of the Branches of the Agricultural Bureau, and that the new Council of Agriculture, which is to take the place of the Central Agricultural Bureau, the Dairy Board, and the Council of the Agricultural College, is to be thoroughly representative of the principal agricultural industries of the State.

Amongst many other funny things written by a person under the name of "Financier" in the *Register* is the statement that he "advocated the abolition of that utterly unnecessary and unjustifiable institution mis-called the Agricultural School, which is a great as superfluity as *The Agricultural Journal*, the

publication of which the Government has so weakly decided to continue, though it is no more needed by the community than three pairs of moustaches are required by one man." That is the opinion of one who is not aware of the good that can be effected by a free interchange of experiences and practices amongst the whole of the producers of this and other States. The *Journal* is not only a reliable medium for the dissemination of valuable and practical information upon agronomical topics, but it is also active in its efforts to prevent and counteract the adoption and following of erroneous ideas that are too often promulgated by the commercial Press, the proprietors of which do not always command the services of experienced men.

The Branches of the Agricultural Bureau exist for the purpose of forwarding progress in every department of agronomical industry. All meetings must not only be open to the public, but the members should use every effort to get the public to be present. At each meeting it should be the earnest desire of members to bring forward a number of useful and practical ideas for the benefit of the people present as well as for publication in the *Journal* and the weekly newspapers. He must be in a dull locality who cannot find at least one valuable idea during the four weeks' interval between meetings for communication at the next monthly meeting. The Bureau has now 107 branches and about 1,400 members. If each member contributes one useful idea at each meeting, and it is published, the annual *Journal* will be the most valuable publication in the world.

Farmers using superphosphates which are at all sticky are compelled to mix some drying material with it to make it run freely through the drills. As the whole object of the treatment of the raw phosphates is to partly release the phosphoric acid from its lime compounds, it follows that if lime is added to the super. there is considerable danger of the fertilising constituents becoming less soluble, and consequently slower in their action. One farmer reports having mixed ordinary lime with his super.; probably the worst thing he could have used under ordinary circumstances. If anything has to be added to dry the manure the greatest of care must be exercised. Gypsum, fine bonedust, or a dry manure already treated with sulphuric acid will probably be safest. Dry wood ashes, crushed shells, dry sand, or even sheep manure may safely be used, always provided the manure is applied to the soil within say forty-eight hours. In any case the mixture should not be allowed to get damp; when it is quite dry chemical changes take place very slowly.

A few years ago (says the *Farmers' Review*) the Campbell method of maize-culture made quite a stir in the country, and it was claimed that a revolution in soil-culture was imminent. The method was tried quite extensively in different States and at the experimental station. Interest in it waned, and gradually it dropped out of sight. Recently, however, the writer, in talking with Professor Cottrell, of the Kansas Experiment Station, learned that the Campbell method is still in use there, and is giving excellent results. Especially was this true last year, when the drought was so extensive that it annihilated crops grown by other methods. The Campbell method necessitates the use of a disced roller

on the soil, the discs sinking into the soil and packing the soil some inches below the surface, but leaving the top of the soil in a state of looseness that serves as a dust mulch. The theory is that the dust mulch on top and the packed soil below tend to hold the moisture, and to give it off only by way of the plant roots. Professor Cottrell says that under this system it has been found possible to raise crops with much less than the average rainfall even in Kansas. The Kansas station is located on hills, and much of the surface soil is 180ft. above water. It will be seen, then, that it is very necessary to conserve all the water that comes in the way of rain, since no form of irrigating is possible.

Some people seem to have got into a deep rut, and don't know how to escape from it. Wheat and hay will hardly pay, but fowls and sheep will pay to keep whilst farmers rest and calmly sleep. They trust to the bulky crops, which involve much labor and return scarcely any profit, whilst they neglect the fowls, sheep, pigs, and cows, which continually bring in money without much outlay. The little rills of silver that run constantly into the farmer's treasury from the sale of butter, eggs, bacon, lambs, mutton, and wool make up a pretty large pool by the end of the year; but it often happens that the big flood that is expected from the sale of the annual crop of hay or wheat leaves the farmer in a bog. The real wealth of a community is comprised in products. Every producer should consider seriously as to which products will give him the surest profits at the least cost in labor and outlay.

Mr. J. Miller, of Merriton, some years ago directed special attention to the value of the buckbush (*Salsola kali*) as a reliable fodder plant for cows and other stock in the arid north when drought destroyed even the indigenous salt-bushes. The same plant appeared a few years ago in Nebraska and other parts of the American States, and caused a panic which resulted in legislation against the so-called "Russian thistle." But experience has shown that this weed was a blessing in disguise. It is very deeply rooting, and maintains its succulence under the most trying conditions of heat and drought. It is slightly prickly, but not sufficiently so to prevent stock eating it, nor do the prickles affect animals in any way. In Nebraska they cut the plant for hay when it is in bloom; it is left a short time to wilt, and put in windrows, then stacked. The "hay" is then soft, green, and much relished by stock.

Selection of the best type and the most prolific of that type—whether of plant or of animal—for reproduction or propagation, is the key to successful improvement. Every farmer—to give one instance only—should maintain one or more nursery plots for improvement of his wheat. He should select the best ears of any approved variety and grow the seed under ordinary conditions; select only the best and most prolific ears from the progeny of the first selection, and go on with this work until he has got something really good. Then grow from that until he has enough to seed a good large area. In the meantime he should continue his small plots in order to maintain his advantage, because constant cultivation without reselection and regeneration will result in deterioration.

The General Secretary of the Agricultural Bureau long ago directed attention to the advantages to be derived by fruitgrowers from packing all fruits for market with the utmost care; and, in respect to tender varieties, to the necessity for packing them in single layers. A few growers of early peaches obtained phenomenal prices through adopting this advice. Mr. G. Quinn, Horticultural Instructor, also strongly supported this practice. Now the Victorian Agent-General in London advises that 420 trays of pears from Tasmania, per *Medic*, packed carefully in single layers, twelve varieties, about half an ordinary case in each package, realised prices as follow:—Bon Cure, 306 trays, 7s. 3d. each; Beurre Bosc, 6 trays, 20s. each; Beurre Anjou, 2 cases, 12s. 6d. each; Autumn Bergamot, 7 trays, 14s. each; Beurre Clairgeau, 21 cases, 10s. and 10s. 6d. each; Chaumontel, 55 cases, 9s. each; Beurre de Capiamont, 1 case, 9s. 9d.; Glou Morceau, 1 case, 14s.; Beurre Diel, 1 case, 6s.; Magnifique, 8 cases, 10s. 6d.; and Pitmaston Duchesse, 1 case, 1s. The condition in which those pears arrived in London is authenticated by the prices paid for them, and if others can contrive to so pack the fruit that it arrives in perfectly good condition, is there any reason why South Australian growers cannot do likewise?

On the value of ensilage as a fodder for cows, *Hoard's Dairyman* has the following:—"Experience has demonstrated that there is no other way in which corn and, in many cases, clover, cow peas, and sorghum can be so cheaply harvested or saved with so little loss as in the silo. And there is no feed known which is less harmful to the cow and her product than good silage, and no feed that can be produced so cheaply. Of course, it does not furnish a complete ration; there should be some dry fodder fed with it, the same as there should be dry fodder fed on pasture, and in addition there should be more or less grain fed also. But grain is a necessity where hay forms the principal roughage."

"Soiling" is a term not generally used in Australia, and some people are not aware that it means the removal of fodder from a field to a place where live stock can eat it without wasting so much of it as would be the case were they allowed to eat it whilst growing. By bringing food into a smaller paddock, and feeding it to stock in racks or similar contrivances, a great saving is made and the paddock is enriched considerably, so that heavy crops of green feed can be raised next season after it is ploughed and seeded. Such paddocks of green feed are valuable when close enough to the homestead to be availed of by the poultry or cows. The enclosures in which animals are "soiled" should be easily removable to other spots when the land is sufficiently enriched.

Taints in milk are not always due to the food that has been eaten, but are often traceable to the odor of the food being absorbed by the milk after it has been taken from the cow. This is particularly the case when sour silage is used. Sometimes the man who fed the cows with silage forgets to wash his hands or change his clothes before he begins to milk, and thus the taint is communicated to the milk. Any odor (whether pleasant or otherwise) in the vicinity of milk will be appropriated by the milk, more especially when warm. Lucern should be left on the field for a few hours before being fed to cows, and will not then communicate any flavor to the milk.

FAREWELL TO MEMBERS OF AGRICULTURAL BUREAU.

About six months ago I consulted the Hon. Minister of Agriculture with a view to rearrangement of the duties connected with the office of General Secretary of the Bureau and editor of the departmental *Journal of Agriculture*, as I felt that it was necessary that the Central Board and the Branches of the Bureau should be brought into closer relations. The editing of the *Journal* compelled a constant attendance at the office, whilst either myself or someone representing the Central Bureau ought to be moving amongst the Branches. Consideration of this matter was deferred until beginning of June, but in the meantime the Hon. Minister of Agriculture had announced publicly that he proposed to make certain changes and appointments, including an amalgamation of the Central Bureau of Agriculture, the Council of the Agricultural College, and the Dairy Board, and appointment of a Secretary of Agriculture. Recognising that all this involved drastic rearrangements on all sides, I thought it would be more pleasant to the Hon. Minister and to myself if I were to act upon the axiom that "one volunteer is worth ten pressed men," and consequently tendered resignation of my position as General Secretary of the Agricultural Bureau and editor of the departmental *Journal of Agriculture*.

It is now over fifteen years since I suggested (in evidence before a Royal Commission on vegetable products) the establishment of the Agricultural Bureau as a means of educating the producers of this State, and the Bureau was started in April, 1888, with a number of practical, patriotic, and influential gentlemen as the Central Board, with whom I was associated as a member. After a short time it was found necessary to have a secretary to give his whole time to the development of the Bureau, but no suitable person could be found, and, at the special request of the members, I agreed to accept the position—temporarily at first, but permanently afterwards—in order to direct the movement in which I had felt so much interest. As the "father" of the Bureau, it is only natural after fifteen years' close nursing that I should have to confess to a feeling of considerable regret in having to say "farewell" to the very many friends amongst the 1,400 or more members of the Agricultural Bureau. In bidding them all "God speed," I trust that every member of the organisation will do all in his power to help my successor and the officers associated with him in making the Bureau even more practically successful in the future than it has been in the past. We, as a body, have done splendid work—of which we may well be proud—and perhaps we could have done more and better work had the seasons and other factors been more propitious. Well, let us hope that the bad times are now over, and that a bright future lies before us.

A. MOLINEUX.

PRESERVING EGGS.

The practice of preserving eggs has been adopted for many years by bakers and confectioners, but it is only of comparatively late years that the general poultry-keeper has adopted it to any extent. Many different methods have been adopted to keep the eggs good for a lengthened period, and now cold-storage is being largely utilised. In New South Wales and Victoria very large quantities of eggs have been preserved during the past season in this way; in Chicago it is stated that the cold stores at one time held many million dozens of eggs. There is little doubt that in a short time the cold-storage method will, to a large extent, displace all other commercial methods of keeping eggs. For household purposes this method is out of the question, and other means

must be resorted to. Of these the two most successful are the lime water and glass water solutions. Of each there are several different modifications, and each seems to be very reliable. Much, however, depends upon the eggs. Unless they are quite fresh they cannot be kept satisfactorily; they do not improve by keeping under the best conditions, in fact they deteriorate somewhat; it is essential, therefore, that the eggs be fresh—if they are infertile so much the better.

LIME WATER.

The following ways of making this pickle have proved satisfactory:—

1. Slake 3lbs. fresh lime in 3galls. water; let stand for twenty-four hours (stirring occasionally), then when well settled draw off the clear solution and place it in tins or jars, adding 12ozs. salt and 1oz. cream of tartar.

2. To a saturated solution of lime water add 1 per cent. of common salt (i.e., 1lb. to 10galls. lime water). A saturated solution of lime water, without any salt or other material, is almost equally as good a preservative.

WATER GLASS.

This can either be purchased as a thick material of the consistency of treacle or in special forms made up by different Adelaide firms for sale in small lots. As a preservative it is quite equal to lime water, is less trouble to make, but is somewhat more expensive. Extensive experiments carried on at the Canada Experiment Station for four years show that a 2 per cent. solution of water glass is equally as good as the stronger solutions previously used. In making a solution of this strength the thick liquid referred to should be secured, and to every pound add 4galls. to 5galls. of water which has previously been boiled. Other preparations of water glass should be used according to the directions given by the manufacturers.

With all pickles care must be taken that the eggs are kept submerged. A weighted board, fitting just inside the receptacle used, will answer satisfactorily. After the pickle is made the eggs can be added from time to time as they are gathered. The writer is using eggs that were put into water-glass pickle last September, and they are in splendid condition and would doubtless keep good for a long time yet.

POULTRY NOTES.

By D. F. LAURIE.

NOTE.—Letters of inquiry, &c., should be addressed to me, c/o Engineer-in-Chief's Office, Adelaide, enclosing stamped envelope if reply required.

Poultry Diseases.—No. 8.

(CONCLUDED.)

PIP.—In itself this is not a disease, but is the visible sign of some trouble connected with the breathing. It may be associated with roup, and is due to the clogging of the nostrils, compelling the bird to breathe through the mouth. Therefore, first seek the cause and treat the actual disease. The tongue, if the scale is prominent, may be regularly moistened with oil or glycerine, which will loosen the scale in time. The nostrils should be cleansed, and the bird treated for roup. Chlorinated soda is good for the nostrils. Use a weak solution; or, if unobtainable, use eucalyptus and oil, equal parts. The practice of forcibly removing the scale from the end of the tongue is as useless as it is cruel.

PNEUMONIA.—This is inflammation of the substance of the lungs, and is responsible for a great many losses, especially in chickens reared in large numbers—in heated foster mothers. There are many predisposing causes, and,

in addition, sudden and violent changes, irritating inhalations, and penetration of the lungs, causing wounds, will all induce pneumonia. The symptoms are hurried and painful breathing, rigors, ruffled plumage, the expectoration often hangs from the beak, the wings droop, and the bird stands "bunched up" and panting. The characteristic "crepitus" (a crackling sound, like paper being crumpled) can be clearly distinguished if the ear be applied to the back of the bird. The mouth is coated, and eventually the breath is very offensive, owing to suppuration of the lungs. Treatment is difficult, and (as a rule) of little avail. Counter irritants, such as eucalyptus, turpentine, iodine, &c., may be rubbed into the skin (under the feathers) on the back over the region of the lungs. Three or four times a day give two drops of spirits of camphor and ten drops of brandy in a teaspoonful of warm milk. An egg beaten up with a little port is useful. The birds must, of course, be housed warmly. Young chicks are huddled up at night in close confinement without ventilation; they breathe vitiated atmosphere, which certainly weakens and poisons the system, and then the sudden change of temperature from the hot box or foster mother to the cool air does the rest.

RHEUMATISM is caused by exposure to damp and cold, especially when the birds are young. As with animals, both acute and chronic rheumatism are seen in poultry. The former is severe, and rarely stays in the same spot for long, while the latter remains fixed, and soon causes permanent enlargements. In acute rheumatism the affected joints are enlarged, painful if touched, and feel quite hot to the touch. This causes a cramped movement. Sometimes the toes are cramped and the limbs flexed, and any attempt to straighten them causes the bird great pain. Treatment consists in giving a little Epsom salts, adding a few drops of nitric acid to the drinking water, and rubbing the affected parts with eucalyptus, embrocation, or such liniments as are sold for the purpose. A little bicarbonate of soda or a few grains of chlorate of potash may be mixed twice daily in the soft food. Salicylic acid enjoyed a great reputation some years ago as a cure. In chronic rheumatism the joints are hard, lumpy, and permanently deformed; but, although the bird moves with difficulty, there is not so much evident pain as in the acute form. Sudden cold or wet weather will, however, induce a return of the acute form. Chronic rheumatism may be relieved by painting the enlargements with tincture of iodine, or by a bandage made as follows:—Take a piece of flannel or soft material, dip in hot water and sprinkle with eucalyptus or turpentine, wrap it round the affected part or place it over it, and then secure with a thick cloth so as to retain the heat. Repeat twice a day. Two grains of carbonate of ammonia and 5grs. iodide of potassium twice a day in the soft food will prove of value.

ROUP.—Formerly this was the most dreaded of all diseases. Nowadays prompt measures are generally successful. Much that has been written under the heading "Diphtheria" applies here, for in reality the term "roup" is purely a fancier's name for a group of diseases, including diphtheria, catarrh, colds, &c. I have more than once written my opinion that certain cases of roup are remarkably similar to typhoid in its severer forms and consultation with medical experts has not solved the question. Filth, insufficient ventilation, and bad food and water, all conduce to attacks of roup. The fact that a sudden chill causes colds, ending in roup, points to the well-known chill which often is a precursor of typhoid; the weakened system is easily attacked. Then, again, with ordinary precautions, common roup, as distinguished from diphtheria, is easily prevented from spreading. In the early stages, that is when catarrh (or cold) is in evidence, remove the bird to a dry, warm, but well-ventilated coop. Good ventilation and sunshine are part of the cure for all diseases. Mix equal parts of eucalyptus and oil and thoroughly clean out the nostrils with a rag and stiff feather dipped in the oil, and with a long feather dipped therein swab out

the throat and windpipe; perform this operation quickly. Do this twice a day for a few days and, as a rule, the case is cured. Canker is another form, and is treated under "Diphtheria." Roup pills are excellent for use during treatment and after a cure has been effected. Messrs. Faulding & Co. make up the paste from formula supplied by me for the convenience of those at a distance. It will keep a long time. (See also Diphtheria.)

SOFT EGGS are due to many causes, the immediate one, as a rule, being inflammation of some part of the oviduct. Stimulating food, fright, &c., as well as an over-fat state, cause these soft or shell-less eggs. Give plenty of old mortar, sea shells, oyster shells, and old bones, crushed. If over fat, lessen the food, vary it, and give some Epsom salts in the soft food twice a week—a packet to each dozen adult fowls; use Douglas mixture in the drinking water, or added to soft food.

SANGUINEOUS EGGS are those with a small blood spot in them, giving the egg somewhat the appearance of having been partly incubated. Although disease of the generative organs of the parent may be the cause, a too free use of stimulating food is a common one.

SCALY LEG is not a disease, but is due to a deficiency in the secretion of the oily product, the absence of which causes the skin to dry up. Very often the trouble is due to a parasite, whose presence sets up irritation in the joints of the scales of the legs. Treatment consists in thoroughly scrubbing the legs with warm soapy water, using a stiff brush, and rubbing off all loose scale, &c., but without causing blood to flow. Then dry the legs, and rub well with kerosene, or apply lard and sulphur, with a little kerosene or oil of tar added. A few applications are necessary. Those who make a practice of overhauling their birds frequently, and at the same time applying a little kerosene to the legs, are never troubled with scaly leg.

SCROFULA AND CONSUMPTION should be treated in the only way, and that is by destroying and burning the bird affected. Treatment is valueless.

Note.—There are many other diseases of poultry, some very rare, others difficult to diagnose. These I have omitted to describe herein, but, as occasion offers, shall be pleased to assist anyone requiring my aid.

A few items for poultry medicine chest:—Olive oil, 1 bottle; kerosene, 1 bottle; flour of sulphur, 1lb.; eucalyptus, 1 bottle; Douglas mixture, 1gall. or more as required; Epsom salts, a supply; boracic acid, $\frac{1}{2}$ lb., in bottle; chlorinated soda, 2ozs., in bottle; iodine, 1oz., in bottle; roup paste, 1 box; ground ginger, small supply in bottle, must be fresh; formaline or formaldehyde, for preserving specimens, 2oz. bottle (kills tick); carbolic acid, No. 1, 1oz., in bottle; glycerine, 2ozs., in bottle.

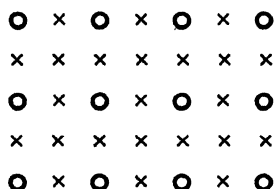
Even with due care disease may appear or accident happen, and prompt treatment is always the keynote. Most of these articles are equally useful for other stock, and for mankind also.

PROFITABLE TREE-PLANTING.

BY JOHN G. KELLY, McLAREN VALE.

Much has been said and written of late years on the subjects—"Making Farm Life More Attractive," "Forest Conservation," "Tree-planting," and kindred subjects. Mr. Thomas Hardy's practical suggestions on roadside tree-planting, appearing in your June issue, are therefore welcomed by all who take an active interest in these matters as a step in the right direction. Perhaps the publication of the results of tree-planting on a small scale in this district, to make a breakwind, may prove of use in forwarding the subject of roadside planting, especially as it will show that it can be done at a much lesser cost than on the lines of Mr. Hardy's suggestion.

In the year 1891 a strip of poor sandy land, with red clay subsoil, situated on top of a rise one chain in width by fifteen chains long, was planted with sugar gums (*Eucalyptus corynocalyx*) and broad-leaf wattle seed, in alternate rows 6ft. apart, as per the following diagram, in which the ○ represents the gums and the × the wattles:—



The land was first ploughed to a depth of 4in., harrowed, and then struck out with the plough in furrows 6ft. apart. The young gums were from the Belair State Nursery, and growing in bamboos. Instead of digging holes for the trees, four spits of earth were turned over, spade deep, and the gums planted by means of a dibble. The wattle seed was first put in a saucepan of cold water and heated up to boiling point, and then allowed to remain in the water until cold; they were then dropped along the furrows by hand, and the earth pushed over them by the foot. There were very few blanks to fill up the following autumn, and both wattles and gums grew rapidly. At the end of the sixth year from planting the wattles were barked. Unfortunately no exact record was kept of the quantity of bark taken off; it was somewhere about 30cwt. Two years ago every alternate gum tree was cut down and barked, in order to give more space to the remaining trees. Those cut down made straight poles from 18ft. to 20ft. long, having a mean diameter of 4½in.

The trees that were then left growing now average 8in. diameter (4ft. above ground), and are straight, shapely trees, about 30ft. high.

The following is the estimated cost of growing the trees and wattles, and the value of the returns and present value of the timber:—

Dr.	£	s.	d.
Rental of one and a half acres for ten years, at 5s. per annum....	3	15	0
Ploughing, harrowing, and striking out rows	0	14	0
Procuring and planting 450 trees, at ½d. each	0	18	9
Preparing and sowing wattle seed	0	5	6
Summer scarifying and hoeing round gums	1	0	0
Filling up twenty blanks	0	5	0
Fencing—112 posts, at 6d. each, 18ft. apart	2	16	0
Fencing—Putting up the fence, 3d. per post	1	8	0
Two barbed wires, 2½cwt., at 18s. 6d.	2	6	3
Trimming trees and wattles	0	5	0
Barking wattles, 1½ tons, at 30s.	2	5	0
Cutting and barking 225 poles	0	10	0
	£16	8	6

Cr.	£	s.	d.
Bark taken off wattles, 1½ tons	9	0	0
225 poles, at 6d. each	5	12	6
225 growing trees, at 1s. each	11	5	0
Fencing, Posts and wire, half cost	2	11	0
	£28	8	6

From the above it will be seen that the returns have already repaid the whole of the costs and rent, and the timber now growing is clear profit, and is, in addition, a useful and ornamental adjunct to the land.

I would suggest, as an alternative to Mr. Thomas Hardy's plan for planting open country roadsides, that, where possible, the trees should be planted in single or double rows, alternating; gums and pines 12ft. apart, with a wattle between. A single row of trees would require a space 12ft. wide, and two rows 24ft. The ground, after being well ploughed and harrowed, to be fenced off with ordinary fencing posts, two No. 6 wires, sheep-proof wire netting (2ft. wide), and one barbed wire on top of the posts. The wire netting would also be required on the road boundary fence. The following is the estimated average cost of planting and fencing for a single row of trees one mile long, allowing for an opening through at every six chains. The cost of a double row would be very little more. Roadside planting necessarily entails more substantial and closer fencing than is required on a farm, and other items are more costly, as a comparison of the two estimates will show:—

Fencing—	£	s.	d.
555 posts, at 6d. each	13	17	6
26 straining posts, 2s. each	2	12	0
Erecting posts and completing fence	16	9	6
Erecting wire netting on boundary fence	2	10	0
Cost of 24in. wire netting, two miles	28	0	0
Half ton No. 6 wire	5	0	0
Quarter ton barbed wire	5	0	0
10lbs. staples	0	5	0
Ploughing and harrowing $1\frac{1}{2}$ acres	1	0	0
Wattle seed and sowing	0	7	6
Summer scarifying	1	0	0
Hoeing round gums and pines	1	0	0
Filling up blanks (30)	0	5	0
Planting 294 trees, at 1d. each	1	4	6
	<u>£78</u>	<u>11</u>	<u>0</u>

As Mr. Hardy has explained, with regard to tree guards being available (after the trees are sufficiently grown to no longer require protection) for use for further planting, the same applies to the fences.

It is always a matter of wonder to me that farmers and other occupiers of country lands in the numerous tree-denuded portions of the Australian continent do not, for their own benefit and profit, grow trees for firewood and for timber that has so many uses on farms and other holdings, also for the benefit that the live stock derive from the shelter afforded in very cold and very hot weather. Those inhuman beings who turn their cattle into paddocks that do not contain a vestige of shade in the hottest summer weather, or during the coldest winter days and nights, should be fined for cruelty to animals.

If people who neglect tree-planting, where it is necessary, could be made to see how cheaply and profitably timber can be produced, they would surely not continue their neglect of so valuable and useful a by-product.

Fencing off blocks or strips of land for tree-planting on a farm does not necessarily need to be so expensive an undertaking as roadside fencing, although it is always necessary to keep all animals from the trees until they are well grown. Landlords should encourage their tenants to plant trees. To those who plead, as an excuse for not planting, that it takes too long before any benefit or profit is derived from trees, or that in planting trees one plants for posterity, and not for one's self, and posterity can take care of itself, Sir Walter Scott's lines may be very aptly applied—

If such there be, go, mark him well;
For him no minstrel raptures swell, &c.

FARM HINTS FOR JULY.

BY THE EDITOR.

Sowing of cereals ought to have been finished all over the State by this time, but there would still be room for hope that a crop would result from very late sowing in some parts—especially in the hilly districts and the South-East. Where crops are backward in the earlier localities light harrows will do much good on fields that are caked on the surface. Much has yet to be learned about this practice, which has been found to be distinctly beneficial in many cases and in others has been declared to be injurious. Perhaps the ill results may have been caused by very dry weather, or by cold weather after the harrowing. At any rate, it is an old practice that is commonly followed by good farmers in other countries, and should be tried experimentally under varying conditions and on different classes of soils by all farmers in South Australia.

As much land as it is possible to deal with properly should be ploughed up for fallow before the soil becomes too dry to pulverise. Land is not properly ploughed when it is laid up in hollow ridges and heavy clods. Such a practice might be proper in a cold, wet country, where the soil bacteria would be chilled or drowned in the water-logged earth; but in this hot dry country it is necessary to have the soil pulverised and laid closely, to maintain the warm moist condition which is so favorable to the multiplication of those ameliorating microbes concerning the work of which so much has yet to be discovered.

A portion of the fallow land should be fertilised with as much farmyard manure—in reason—as can be spared, and this land should be sown with sorghum, holcus, maize, or other fodder plants directly danger from night frosts is over.

Ensilage pits should exist on every farm and station in the dry parts of Australia, and should be kept full, as a safeguard against shortage of food for stock. It cannot be denied that it costs time and labor to make silage, and if it were valued at a time when feed is abundant on the land the silage would not be worth the labor of preserving it. But what would be the value of 1,000 tons of silage on any of those runs now, where sheep are dying by thousands daily from sheer starvation? I have just received a letter from a sheep station beyond Hergott where 1,000 sheep per day are dying, and a number of men are employed in lifting thousands of weak sheep on to their legs, so that they may stagger along on the hopeless search for a mouthful of grass! Every farmer should make silage, and also save nearly all of his straw.

During the next four or five months sow mangold and beet seed in rows 30in. by 15in., 1in. to 2in. deep. Where soil is rather shallow try Globe or Tankard mangolds, and longer varieties on deep soils. Silesian White beet and sugar beet may be grown upon comparatively shallow soil, and come in nicely for cows. Rich soil is wanted by beets and mangolds, and if it is brackish or rather salt it will be none the worse. The capsules usually contain more than one seed, therefore it is necessary to remove the weakest plant where more than one is growing. With care to avoid bending or injuring the tap-root mangolds and beets may be used to fill up blanks when singling the plants. A few of the lower leaves of the mature plants may be removed for feeding to cows daily, commencing with a very moderate ration and increasing as they become used to the food. Frequent hoeing about the plants causes more luxuriant growth.

This is a good time to plant timber trees for windbreaks and shelters. A single tree on an open plain cannot thrive. Plant a number of rows for a windbreak, or put in a considerable number in a clump for a shelter. About

6ft. to 8ft. apart is best, but when the trees have reached 10ft. in height every second tree should be taken out. Trees should be suited to the locality in which they are to live. Sugar gums seem to thrive in almost every locality, but may suffer from frost when young. The Aleppo pine is also readily suited to many situations. Carob beans, if soaked in a wet flannel in a warm position until they germinate, may be sown, and will probably make good trees if protected for a year.

Still there is a chance for a crop of rape if the soil is rich and deep, and if the seed is sown in time. Three or four pounds of seed is enough seed to drill an acre, and hoeing between the plants will help their growth.

Sow 2bush. of peas by drill on an acre. Use bonedust and super. mixed, say at the rate of 100lbs. bonedust and 50lbs. super. Sow a very small quantity of barley or oats in the drills to keep the peas off the ground. The drills should be 30in. to 36in. apart. Garden peas will probably be most acceptable, unless several acres are to be grown.

Cabbages and kails for stock feeding should be planted out as early as possible, giving plenty of room between the rows and plants for cultivating, as well as for the development of the plants.

Sow carrots, parsnips in drills for feeding cows and horses; mustard in drills 6ft. apart for seed. Four or five pounds of seed is ample for an acre. Turnips may still be sown for sheep.

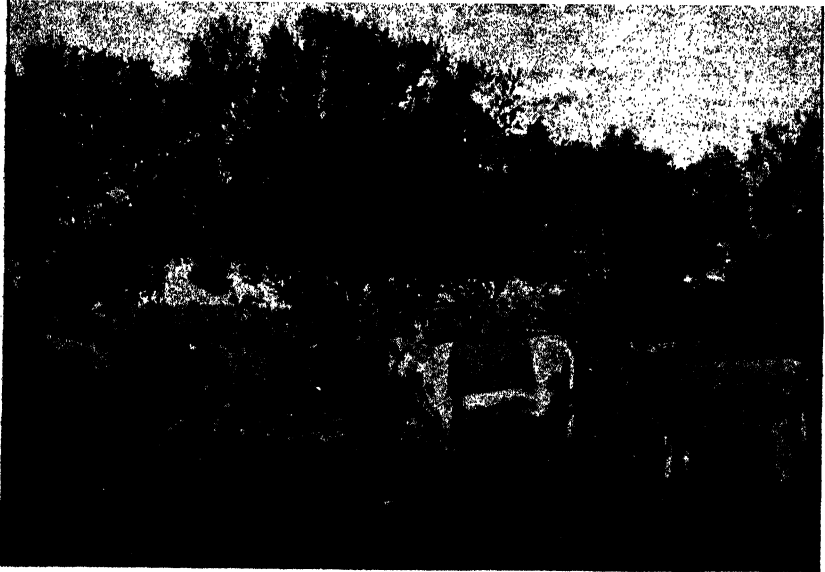
Prepare land by manuring and deep ploughing for maize, millets, sorghum, and all other summer fodder crops, the seeds of which should be sown when all danger of night frosts is over. It is not advantageous to raise any plant too early in the season, because it only lingers and grows old without growing large. Plants that are started when the weather is constantly becoming warmer in spring will soon pass those that were growing a month before. All summer crops should be sown in drills, and be frequently cultivated whilst growing.

Land for lucern (to be sown in September or October) should be deeply and finely pulverised. Make it as level as possible, and destroy all weeds before sowing the seed. A good dressing with bonedust at present time will help the plants when they start. The young lucern is easily injured by frost, but old plants will withstand a lot of cold. Deep alluvial soils, where water exists at 14ft. to 20ft. below, are best for lucern. Sandhills, if not too poor, will do well; but probably the sand lucern (*Medicago media*) would do better both on sand and on rather dry soils.

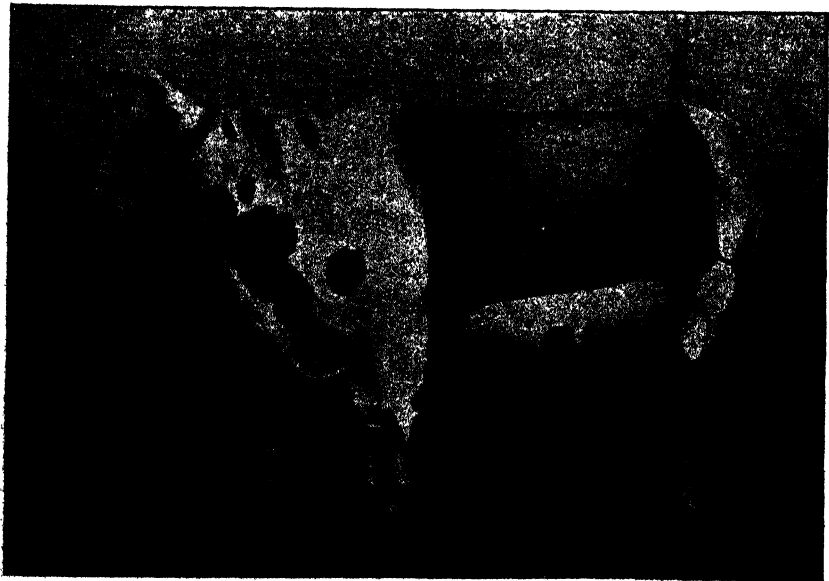
SHELTER FOR CATTLE.

With the advance of the cold weather, a few remarks on the necessity for shelter for dairy cows is opportune. Throughout the whole dairy world the effect of extremes of temperature on the quality and quantity of milk has been tested at various times. Even where the cows are stabled in the winter it is found that with a lowering of the temperature there is usually a falling off in the yield of butter. Where the cows are not stabled at night the yield has been found to vary to a considerable extent. The financial aspect of the question is altogether overlooked by the majority of dairymen. With some the question of the comfort of the animals may not have great weight, but they must remember that in this matter comfort goes hand in hand with profit. A dairy cow is practically a machine converting the food she receives into milk. If she converts it into meat she cannot be regarded as a dairy cow. A certain portion of the food consumed is, however, required to keep up the normal temperature of her body. During cold weather a greater portion of her food is so utilised than in

warm weather. The colder it is the greater demand on the food for this purpose, and the less able is the cow to produce her normal flow of milk. Dairymen will easily see that the question of keeping the animal warm is most important. A good warm stable cannot always be provided, nor is it altogether necessary.



COWS IN SHELTER OF BREAKWIND.



SHOWING METHOD OF SECURING THE COVERING.

If rough shelters are provided, and the cows have some covering to protect them from the cold, it will suffice under average conditions, except in our coldest districts. A number of our cowkeepers provide rugs made of second-hand wheat bags, or similar material, and they are confident that the small outlay is more than repaid by the extra yield of butter. Mr. W. B. Wyllie, late of Kapunda, was one of the first to utilise rugs on a large scale in South Australia, and as he kept careful records of the daily yields of his cows, his experience is of great value. He stated that he tried various means, but until he adopted the rugs he could not reduce the cost of butter production during the winter months. When, however, he used the rug on one cow the results were so satisfactory that, as quickly as he could, he had rugs provided for the whole herd, using second-hand cornsacks, two being sown together, and secured with ropes and straps to keep the cover in place, as shown in the illustrations. The grease from the cow soon makes the cover waterproof, and if properly cared for they last a long while. Mr. Wyllie stated that the result of covering the cows whenever the temperature went below 60° F. was that they produced one-third more butter on a smaller quantity of food, and kept in better condition than before. Mr. Wyllie's statement to our Dairy Instructor was:—"Ever since I put covers on my cows there has not been any variation in the quantity and quality of the milk yield. Before I rugged my cows I have lost as much as 20galls. of milk and 10lbs. of butter from the evil effects of one storm, and the cows have suffered to such an extent that extra feeding did not compensate for the injury through exposure. At present these storms have no injurious effects on them, and we never increase the feeding on account of rough weather. It might interest you to know about the first cow I put a cover on. She was a splendid animal, and had made as much as 17lbs. of butter in a week, and this was off the pan system. Before I purchased this cow she suffered severely from cold, and would stand under a bush when it was raining and blowing. After being covered, in less than an hour she was out feeding in the rain, and within a week she had increased her produce by one-third, and I reduced her feed by nearly one-half. My cows are as healthy a herd as there is in South Australia, and are always in first class condition. Tubercular disease has not been traced to any for the past four years."

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Company report:—

July 1, 1902.

Two distinct barometrical disturbances during June gave welcome rains throughout the agricultural areas, the Southern, Lower North, and Hills districts receiving from 2in. to 5in.: but over the usual droughty parts the fall was all too light to allay anxiety, though enough to start the wheat plant and encourage the hope of a good sub-soil soaking, which may be expected if at any time surely during July, our average wettest month. The comparative absence of autumnal frosts this season helped sheep and lambs along much better than was expected where the country was so bare of feed; but the long drought still continues over a large extent of our outside pastoral country.

The commercial tone is very quiet, the looked-for recovery as the result of the declaration of peace having not yet shown up much. Mining matters are still flat, but apparently a shade more hopeful. A few embarrassments amongst country traders show how trying the times have been in some districts.

The European breadstuffs market, when last we wrote, was weak, with wheat at 29s. 6d. per quarter, c.i.f., for Australian, and early in June a further easing showed, several cargoes from the Commonwealth having been sold at under 29s. Owing to unseasonable rains in Europe, however, the market subsequently hardened, and is now firm, with sales at over 29s. 6d. Sydney is a shade weaker, though there is still a heavy up-country demand. Melbourne dropped 2d. per bushel, and is not over strong now at 4s. 1d. Adelaide values declined in sympathy with our eastern neighbors, but business is very slack, transactions being few and far between. The flour trade may be described as lifeless, only small local business doing. In offal lines, it was a fair export trade for bran and pollard that kept values fairly sustained, the local demand having fallen off considerably, though nearly all the big mills are

running only at half time; the output being thus considerably lessened. In forage lines the market has been dull during the month, but values in feeding grains, as well as hay and chaff, have sustained through the export demand, though Victoria is again cutting us out of the Sydney market, our shipments now only consisting of the fulfilment of previous orders.

The potato market ruled rather unsatisfactory for traders during the month. Some speculators in imported succeeded in encouraging local holders to advance their ideas of value, with the result that very little reduction was made in stocks, which are also found to be a good deal heavier than was calculated a month ago. Sellers now are therefore more anxious to quit, a drop of 10s. showing last week. Inter-State markets have also weakened, so that the prospects at moment do not seem to indicate higher rates in the near future. Holders of onions in the Gambier district do not feel too confident either, their sales for June proving exceptionally light, and they also have lowered their ideas of value, and will probably have to accept yet lower rates to clear.

Lessened consumption, owing to high prices in such lines as butter, continues, but, supplies having started to increase, we may expect to see prices considerably fall away during the month, although no surplus may be reckoned on until August at earliest. The seasonable run down in value of eggs set in a fortnight ago, but, owing to unusually cold weather of late, the decline is at moment arrested. A drop to spring rates, however, is sure to set in during July. A heavy winter trade in bacon is doing, owing to the dearth of butcher's meat, but quotations, notwithstanding, are a shade easier. Sales of cheese have been disappointingly light, and, as importers had stocked somewhat heavily, the line is flat at weakening rates. Honey is also slow of sale again. Beeswax brisk. A good turnover doing in almonds.

In carcass meat the month has been very satisfactory to producers, good clearance and prices being secured for pork and veal. Poultry values have been uneven, the export trade having ceased for a time; but local demand has kept the market clear, though prices have not been high; still good fowls realise fairly, though turkeys sell cheap, but ducks fetch high figures.

MARKET QUOTATIONS OF THE DAY.

Wheat.—Port Adelaide—Shipping parcels, f.a.q., 3s. 11d., f.o.b.; farmers' lots, 3s. 9½d. on trucks, per bushel of 60lbs.

Flour.—City brands, £9 to £9 5s.; country, £8 10s. to £8 15s. per ton of 2,000lbs.

Bran.—1s. 2d. to 1s. 2½d.; pollard, 1s. 3d. to 1s. 3½d. per bushel of 20lbs.

Oats.—Local Algerian and dun, 3s. to 3s. 6d.; prime stout feeding, white, 3s. 6d. to 3s. 8d. per bushel of 40lbs.

Barley.—Malting, 4s. 3d. to 4s. 6d.; Cape, 3s. 3d. to 3s. 6d. per bushel of 50lbs.

Chaff.—£3 17s. 6d. to £4 2s. 6d. per ton of 2,240lbs., bags in, dumped, f.o.b., Port Adelaide.

Potatoes.—Tasmanian, £5 12s. 6d. to £5 17s. 6d.; Mount Gambiers, £5 per 2,240lbs.

Onions.—Local Spanish, £5 10s. to £6 10s.; Mount Gambiers, £7 to £7 5s. per 2,240lbs.

Butter.—Creamery and factory prints, 1s. 6d. to 1s. 7½d.; private separator, 1s. 5d. to 1s. 6d.; best dairy and well-graded store, 1s. 3d. to 1s. 4½d.; imported bulk, 1s. 1d. to 1s. 3d. per pound.

Cheese.—South Australian factory, 6d. to 7½d.; New Zealand, to 8½d. per pound.

Bacon.—Factory-cured sides, 7d. to 7½d.; farm lots, 5½d. to 6½d. per pound.

Hams.—South Australian factory, 7½d. to 8½d. per pound.

Eggs.—Loose, 11½d.; in casks, f.o.b., 1s. 1d. per dozen.

Lard.—In bladders, 7d.; tins, 6½d. per pound.

Honey.—3d. for best extracted in 60lb. tins; beeswax, 1s. 2d. per pound.

Almonds.—Fine softshells, 6d.; kernels, 10d. per pound.

Dressed poultry.—Fowls, 4d. to 5d. per pound.; turkeys, 6½d. to 7½d.

Carcass Meat.—Bright handy-sized shop porkers, 5d. to 5½d.; good baconers and ordinary porkers, 4½d. to 5d.; heavy and rough, 2½d. to 3½d.; prime vealers, 3½d. to 4d.; ordinary sorts, 2½d. to 3d.

Live poultry.—Heavy-weight table roosters, 1s. 6d. to 2s. each; ordinary cockerels and good hens, 1s. 2d. to 1s. 6d.; poor and light fowls, 8d. to 11d.; ducks, very saleable at 1s. 9d. to 2s. 6d.; geese, 2s. 3d. to 3s. 3d.; pigeons, 5d.; turkeys, 4½d. to 6d. per pound live weight for fair to good table birds.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, flour, and forage for export are f.o.b. prices at Port Adelaide. Dairy products are city auction mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese.

BRINE-CURING OF BACON.—For 100lbs. bacon: Eight pounds salt, 2lbs. brown sugar, 2ozs. saltpetre, ½oz. potash, 4galls. water. Boil all together; allow it to get cold; rub meat both sides with salt; let it stand forty-eight hours; then place in a cask; fill up with the above brine; let stand six weeks; then hang up till dry, and place in cold smoke.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of June, 1902:—

Adelaide	3·87	Manoora	2·62	Macleesfield	5·05
Hawker	1·39	Hoyleton	2·85	Meadows	6·27
Craddock	0·55	Balaklava	2·53	Strathalbyn	3·39
Wilson	1·18	Port Wakefield	2·35	Callington	2·30
Gordon	0·90	Saddleworth	3·33	Langhorne's Bridge..	1·82
Quorn	1·52	Marrabel	2·85	Milang	2·00
Port Augusta	1·16	Riverton	3·69	Walleroo	2·46
Port Germein	0·94	Tarlee	2·43	Kadina	2·75
Port Pirie	1·26	Stockport	2·26	Moonta	2·54
Crystal Brook	1·74	Hamley Bridge	2·29	Green's Plains	2·77
Port Broughton	1·57	Kapunda	2·93	Maitland	4·98
Bute	2·39	Freeling	2·42	Ardrossan	2·57
Hammond	1·03	Stockwell	2·83	Port Victoria	3·13
Bruce	0·63	Nuriootpa	3·58	Curramulka	3·96
Wilmington	1·82	Angaston	2·64	Minlaton	3·87
Melrose	2·91	Tanunda	3·65	Stansbury	2·91
Booleroo Centre	1·38	Lyndoch	4·04	Warooka	3·30
Wirrabara	1·33	Mallala	3·37	Yorke town	3·31
Appila	1·01	Roseworthy	2·72	Edithburgh	3·82
Laura	1·89	Gawler	3·23	Fowler's Bay	2·61
Caltowie	2·40	Smithfield	3·32	Streaky Bay	3·13
Jamestown	1·80	Two Wells	2·77	Port Elliot	2·72
Gladstone	1·58	Virginia	3·53	Port Lincoln	2·87
Georgetown	1·87	Salisbury	4·46	Cowell	1·04
Narridy	1·89	Teatree Gully	5·72	Queenscliffe	3·56
Redhill	2·43	Magill	5·11	Port Elliot	3·36
Koolunga	1·77	Mitcham	4·70	Goolwa	2·58
Carrieton	1·03	Crafer	11·42	Meningie	2·87
Eurelia	0·92	Clarendon	7·01	Kingston	3·60
Johnburgh	0·37	Morphett Vale	3·46	Robe	2·95
Ororoo	0·96	Noarlunga	3·71	Beachport	3·16
Black Rock	0·76	Willunga	4·32	Coonalpyn	3·00
Petersburg	1·20	Aldinga	3·92	Bordertown	3·38
Yongala	1·40	Normanville	4·15	Wolsley	3·01
Terowie	1·17	Yankalilla	4·33	Frances	2·64
Yarowie	1·30	Eudunda	2·12	Naracoorte	3·12
Hallett	2·17	Truro	2·23	Lucindale	3·38
Mount Bryan	2·72	Mount Pleasant	5·64	Penola	2·33
Burra	3·04	Blumberg	7·21	Millicent	4·26
Snowtown	2·43	Gumeracha	7·63	Mount Gambier	4·18
Brinkworth	2·66	Lobethal	7·78	Wellington	1·60
Blyth	2·39	Woodside	4·81	Murray Bridge	1·98
Clare	4·59	Hahndorf	8·09	Mannum	1·29
Mintaro Central	4·87	Nairne	5·44	Morgan	0·48
Watervale	6·10	Mount Barker	6·12	Overland Corner	0·83
Auburn	4·01	Echunga	5·61	Renmark	1·01

MISCELLANEOUS NOTES.

FEDDING CALVES.—Hay tea for calves is made by boiling sound hay in water for half an hour, the hay being best cut into $\frac{1}{2}$ in. chaff before boiling it. For a young calf under a month old 2galls. of this hay tea with 4ozs. each of flax seed and wheat middlings is a full feed for one day. In an experiment made by a well-known dairy expert it was found that calves fed in this way for sixty days, the middlings being increased during this period to 1lb. a day, gained something over 2lbs. a day of live weight for the whole sixty days. A farmer who fed six calves on the same rations made an increase in weight of 2½lbs. daily for the sixty days the calves were fed.

JERUSALEM ARTICHOKE.—Referring to the Jerusalem artichoke, the *Australasian* of May 17 quoted:—

At a meeting of a Farmers' Institute in England recently a speaker said:—"I have found artichokes to be the most satisfactory vegetable food that I have ever grown. They can be grown with very little trouble, and are, without doubt, most healthful food. We allow the pigs to dig them themselves, and they have a great relish for them. The exercise they receive in seeking for the artichokes is in itself healthful for them. The pigs grow rapidly when fed upon them, and they have a tendency to produce lean meat. I would not consider it desirable to feed on artichokes alone, but they should be fed in conjunction with a moderate grain ration. One great advantage with artichokes is that they can be fed in the spring of the year, at a season when other vegetable food is not available. The winter frost does not injure the tubers when left in the ground. In a suitable soil they will give a very large crop, running from 600bush. to 1,000bush. per acre. The system of cultivation I have followed is similar to that given to potatoes, planting in drills 18in. apart, and the rows 30in. apart. The most suitable soil for their growth would be a sandy loam, but I believe they will grow well on any soil."

This "artichoke" is a species of sunflower which seldom or never bears seed, but produces, in favorable soil and climate, heavy crops of tubers. In the rich light soil of some parts of the South-East the "Jerusalem artichoke" does well.

SALT FOR LIVE STOCK.—The French Government some years ago appointed a commission of scientific men to investigate the subject of the use of salt for cattle, and the conclusions they arrived at were most favorable to its use for farm animals. For milch cows the allowance for each animal daily is 2ozs.; for fattening and stall-fed oxen, 3½ozs.; for fattening pigs, 1½oz.; for fattening sheep, 1oz.; and for horses, 1oz. For daily use these allowances need not be exceeded, but from our experiences of using salt for farm stock, we much prefer laying down rock-salt in convenient places to adding common salt to the food. When supplied in this way the animals can help themselves, and it may be taken as a certainty that they will take no more of it than may be required. The only objection to giving salt in measured quantities as given above is that through forgetfulness the supply will not be given regularly, and, as pointed out already, "the composition of the blood is constant," and therefore the chemical supply should be regular. But without going into the question of the composition of the blood, the feeder of farm animals can always see the advantage of using salt if he will only observe their improved appearance and condition when they are allowed its use regularly. Its action in producing a healthy, mellow skin can be easily noticed in the handling, while the coat of hair is thick and soft. These advantages are worth obtaining, even if we say nothing about improved condition.

CENTRAL AGRICULTURAL BUREAU.

MONDAY, JUNE 16, 1902.

Present — Mr. F. E. H. W. Krichauff (chair), Sir Samuel Davenport, K.C.M.G., Messrs. W. C. Grasby, M. Holtze, H. Kelly, R. Marshall, T. B. Robson, C. J. Valentine, W. F. Snow, and A. Molineux (Secretary).

Resignation of Central Bureau.

The CHAIRMAN stated that he had received the following letter from the Hon. Minister of Agriculture :—" With the view to economy and efficiency in the various agricultural departments under my administration, I have the honor to inform you that it is proposed by the Government to appoint a council of agriculture representative of all our natural productions, instead of continuing the three bodies now existent, viz., the Central Agricultural Bureau, the Agricultural College Council, and the Dairy Board. I therefore venture to approach you with the request that you will be good enough to place in my hands, at your earliest convenience, the resignation of the Central Bureau, in order that I may be able to give effect to the intentions of the Government. In conclusion, I may assure you that the Government highly appreciates the excellent and disinterested services the Bureau has rendered to the State, and under the proposed new regime I feel satisfied that you will recognise that the work will be performed with equal satisfaction by one body as by three, as at present."

Sir S. DAVENPORT said he had pleasure in moving—" That, in compliance with the request of the Minister of Agriculture, we tender to the Minister our resignations as members of the Central Agricultural Bureau." They must all feel that the Minister had the best interests of the producers and the State generally in view in the re-organisation proposed. The sole object of the members in meeting together was to benefit the producers, and, while they all regretted that the Central Bureau should cease to exist, they could truthfully say they were pleased to assist the Minister in his objects. The members of the Bureau had, during a period of fifteen years, worked gratuitously to advance the interests of the producers, and they could look back with considerable satisfaction to the results of their labors.

Mr. KELLY seconded and supported Sir Samuel's remarks. Other members also spoke, and expressed the hope that the re-organisation proposed by the Minister would result in benefit to the State.

Future of the Bureau.

The CHAIRMAN reported that the Minister advised him that in the proposed re-organisation it was intended to foster the Branch Bureaus in every way, and to continue to post the *Journal of Agriculture* to the members, as in the past.

The SECRETARY stated that the Minister had instructed him to call the usual Congress of the Bureau in September.

Resignation of Secretary.

The SECRETARY stated that, in view of the Ministerial proposals, he had felt it his duty to tender to the Hon. Minister his resignation as Secretary and editor of the *Journal of Agriculture*. He deeply regretted having to sever his connection with the Bureau, of which, as they all knew, he was the originator.

On the motion of Mr. HOLTZE, a hearty vote of thanks was accorded to the Chairman, the Secretary, and other officers of the Bureau, for the manner in which they had fulfilled the duties of their offices.

New Members.

The following gentlemen were approved as members of the undermentioned Branches :—Morgan, Mr. F. R. Haupt ; Forster, Mr. S. Retallack ; Koolunga, Messrs. James W. Atkinson and Charles J. Allen ; Mundoorra, Mr. J. P. Angley ; Davenport, Mr. James McGrath ; and Bute, Messrs. F. Gitsham and A. Cousins.

Reports by Branches.

The SECRETARY reported receipt, since previous meeting, of fifty-four reports of Branch meetings.

REPORTS BY BRANCHES.

Pine Forest, May 20.

Present—Messrs. W. H. Jettner (chair), J. Phillis, W. Kempster, A. Mudge, E. Masters, F. Masters, G. Inkster, and R. Barr (Hon. Sec.).

THE AGRICULTURAL BUREAU.—The Hon. Secretary read *Advertiser's* account of Central Bureau meeting held on May 19, where notice of the death blow to that institution was made by the Chairman. Members of this Branch regret the avowed intention of the Minister to dispense with the Central Bureau. Economy is undoubtedly necessary under present conditions, but it could not be denied that the Bureau has proved a good and efficient educational medium for agriculturists at a small cost. The benefits accruing to farmers from interchange of ideas, methods of working, care of stock, diseases, remedies, and treatment of stock, wheat, grasses, manures, and a hundred other things affecting the up-to-date agriculturist, as embodied in the *Journal of Agriculture*, could not be over-estimated. The compilation of all this information in a concise and readable form had been well done by the General Secretary. Questions upon all kinds of subjects were answered by him daily, and he was qualified for his position as adviser and manager of the institution, and members hoped it was not the Minister's intention to retrench him. The *Journal* was well worth the price asked for it, but it was considered unfair to charge the Bureau £900 for printing if, as stated, the work could be done by a private firm for a third of that sum.

POULTRY-KEEPING AND THE INCUBATOR.—Mr. F. Masters read the following paper:—

Poultry-keeping on the farm does not occupy the attention it deserves, nor its rightful place. That the farmer has ideal conditions in which to rear poultry profitably must be conceded, and many are taking advantage of those conditions ; yet there is room for improvement in many cases. The class of poultry met with in the major number of our farms is not a very high one. Very few pure-breeds are kept, and the balance usually have been crossed and recrossed till type is entirely lost. Exchanges of sittings of eggs with neighbors have not usually been attended with much success as regards improving their good qualities. Too little care is frequently taken in selecting eggs for setting, and, instead of rearing from the best layers, the first eggs coming to hand are hatched. To take advantage of our position in relation to the poultry industry, let us first decide which breed or breeds we will patronise. Do we want eggs or table birds? In my opinion the most payable to the farmer would be, at present, the egg producers. Taking an average price for eggs of 8d. per dozen, I believe that, by feeding wheat to fowls of a good Minorca or Leghorn breed, we should obtain for it 4s. per bushel - a good advance on the average price we have received for it the last four years. Some may say we could not keep poultry enough to eat all our wheat, and that large flocks of poultry appear subject to diseases of various descriptions. To these objections I reply, we can keep many more than we do, and that would mean greater profit from our farm, and the fact that larger flocks of poultry appear more liable to disease is only so much proof that we neglect sanitary precautions, and fail to give them the attention in proportion we bestow on a smaller number. If farmers gave the larger flock this attention we would then cease to hear this cry of disease

attacking large flocks more than small ones. The infusing of new blood from good laying breeds by introducing roosters is rather a slow process, and I think it better to start with a pen of pure birds, breed from them, and dispose of the mongrels as the others are ready to take their places. Our frequent complaint is that great difficulty is experienced in getting eggs when they are dear; that is in the winter months usually. A few Orpingtons might be kept for this purpose, or we must have early chicks. With the question of early chicks comes that of broody hens when we want them. They are generally scarce. Here, however, science comes to our aid, and provides us with a capital substitute in the incubator. In selecting a machine we must see that it is constructed in obedience to the laws of nature, especially with regard to heating and ventilation, and should have a good regulator. The cost of kerosine would not run to $\frac{1}{2}$ d. per egg, varying according to size of machine and temperature of room, the larger being more economical than the smaller. The operator has to learn his machine to produce the greatest results; but a novice, at first attempt with "The Modern," a machine designed by the Government Poultry Expert, obtained a hatch of 90 per cent., which machine I should recommend. It costs £8 10s. for 120 egg capacity. Of two other machines purchased at the same time, one failed to hatch at all, and the other very erratically; so that the main thing is to get an effective machine, and with this ends the trouble of getting broody hens, although if we have them we can still make use of them to mother the chicks hatched by the machine, which will save us some little trouble in rearing, although they do well given a fair amount of care and attention. With an incubator we have no vermin to keep the chicks in check, and, looking at their advantages, no farmer should be without one, and he would find his poultry more profitable if the above recommendations were followed.

Whilst agreeing generally with the writer, members did not think it advisable to keep pure breeds of fowls, since experience has taught them that these are more liable to disease. Mr. Mudge prefers the Houdan or the Indian Game cross for general use on the farm. Mr. Kempster objects to Plymouth Rocks on account of weight and clumsiness.

BANDY-LEGGED HORSES.—Mr. Kempster mentioned the prevalence of bandy legs amongst young horses on scrub country, and would like to know the cause.

Bute, May 20.

Present—Messrs. W. A. Hamdorf (chair), W. H. Sharman, C. Ebsary, J. H. Barnes, S. Trengrove, F. Trengrove, R. Commons, M. Stevens, A. Schroeter, H. Schroeter, D. McEvoy, J. H. Brideson, A. Sharman (Hon. Sec.) and two visitors.

POULTRY.—Members favor Leghorns or Dorkings for farm breeding.

WATERING HORSES.—Mr. Barnes has often allowed his horses to drink when in a lather of sweat, and never found it hurt them. Mr. McEvoy said if a horse has been without water for twelve hours and is then allowed to drink too much cold water it would be very dangerous. Mr. Schroeter would limit the quantity of cold water when horses are very hot. Mr. Ebsary had known of horses getting chills and dying when they had drunk too much cold water when they were hot. It would not have hurt them had they been kept waiting twenty minutes.

WEANING COLTS.—Mr. F. Trengrove wished to know how long a colt should be kept shut up to thoroughly wean him. Mr. F. Trengrove said he shut up a foal three or four weeks and it began to suck the mare when let out. Mr. Ebsary said a foal commenced to suck and brought back the milk after being kept away two or three weeks. Mr. Schroeter said it depends upon the sort of mare. If she be in foal she will go off her milk much quicker than a mare that is not in foal. They always kept their foals shut up three weeks exactly, and seldom had trouble with them after that.

BEST WHEAT FOR DISTRICT.—At a meeting held April 27 Mr. Ebsary read a paper on "Which is the Best and most Profitable Wheat to grow in this District?" He chiefly favored Marshall's No. 3, but liked Gluyas' Early,

Steinwedel, and Purple Straw. One farmer got five bags per acre of Marshall's No. 3 last season, and several others reaped large crops. Most members think that rust-resistant varieties require more rain than is wanted for the other sorts.

CONFERENCE.—Mr. McEvoy wanted to know why the editor of the *Journal of Agriculture* did not print his paper in full, as read at the Bute Conference. All the other papers were printed in full, and he thought his contained as much information as the others. [Simply a matter of opinion. The editor did not consider that the paper was worth printing in full.—GEN. SEC.]

Boothby, May 27.

Present—Messrs. R. Carn (chair), E. Bradley, J. Bell, R. Leonard, A. F. Henderson, G. Way, H. S. Robinson, and A. A. Turnbull (Hon. Sec.).

WORMS IN HORSES.—Mr. Robinson had a horse die which had numerous worms over a foot long in the stomach, besides a large tumor and many of smaller size. [Mr. C. J. Valentine thinks the worms may have caused the abscesses, which no doubt killed the horse. In such cases give 2 drachms sulphate of iron in warm bran or pollard three times a week.—GEN. SEC.] Some members said horses affected with worms always fall off in condition. Others had known horses to maintain good condition although attacked by worms.

IMPACTION.—Mr. Carn has been successful in curing cattle showing first signs of impaction by giving a pound of Epsom salts in water three or four mornings in succession. Mr. Bradley spoke highly in favor of bonemeal as a preventive of impaction and other disorders of the stomach. He placed a tub containing bonemeal within reach in the yard, and the cattle took small quantities as required. [Care should be taken to use only bonemeal from properly steamed bones. Raw bones *may* introduce various diseases. Ordinary bonedust or bonemeal sold as a fertiliser should on no account be used for feeding stock.—GEN. SEC.]

Elbow Hill, May 28.

Present—Messrs. J. F. Robertson (chair), C. G. Ward, W. Ward, H. Dunn, J. Harvey, S. G. Pike, J. Wake, F. Spence, G. C. Dunn (Hon. Sec.), and seven visitors.

POSITION OF BUREAU.—Members all agreed that the information gained from the *Journal of Agriculture* is of great value, and a majority favored the payment of a small subscription towards the annual cost of the same.

"DOMESTIC ANIMALS: THEIR SHELTER, &C., PLACES."—Mr. Pike read a paper to the following effect:—

Horses are the most important of a farmer's possessions in animal life, and in order to keep them healthy their stables and mangers must be kept clean. When allowed to stand on damp manure their fetlock joints usually become puffed; and, if allowed long to remain, the trouble extends up the legs, and the animal becomes languid, falls off in condition, and finally is crippled. The manure should be removed from the stable at least twice a week; but too often this duty is neglected. Water should be at all times readily available by horses, close to their food, as this will materially aid in retaining their good condition. Where cows have their grazing close at home they seem to thrive considerably better than where they have to travel some distance to and from their feeding ground. Do not think it a good plan to feed cows whilst they are being milked. Fowls prefer to roost on the buggy or family conveyance to resting at night in the most elaborately constructed poultry-houses; but they pay well to keep, and can be kept off those undesirable resting-places. Pigs should have clean sties, straw bedding, and some wood ashes occasionally with their food.

FARM LIFE.—Mr. H. Dunn read a paper from the *Journal of Agriculture* on "How to Make Farm Life Attractive."

"HORSE-BREEDING."—Mr. W. Spence read a paper on "Horse-breeding," to the following effect:—

It is always well to look for a good constitution in sire and dam. South Australia has one of the best of climates for breeding good-constituted horses. The roadster is the best, both for the arts of peace on the farm and for purposes of war in the field. India and Africa both require this class of horse, which is able to carry the rider and his light equipment, and is easily kept. On the farm the roadster is quicker and hardier than a heavier horse, but for road work a heavier class is more generally required.

In discussion, all members agreed that horses should have water before feeding. Hay cut by mower is more readily eaten by horses than that cut by string-binder and sheaved. A nuggety draught is preferable to a roadster, and color does not affect the usefulness of a horse.

EGG-PRESERVING.—A member wished to know how to preserve eggs with water glass. [See *Journal of Agriculture*, August, 1900, page 10.—GEN. SEC.]

Johnsburg, May 17.

Present—Messrs. G. H. Dunn (chair), F. H. Hombach, T. Potter, F. W. Smith, M. I. Read, L. Chalmers, J. Sparks, W. McKitchie, P. Caughlan, M. E. Redden, T. Johnson (Hon. Sec.), and one visitor.

WHEAT-CLEANING.—Mr. Sparks read a paper on this subject, to the following effect:—

While engaged in cleaning my wheat it has often struck me that the work should be done more rapidly. Why cannot we get a machine to do the work as fast again as those we use? Especially is this desirable in a light crop with a large proportion of flag. I think that in some machines there is room for improvement in the fixing of the hopper or receiver. Owing to being too straight the grain runs on to the sieves quicker than it is possible for them to make a good sample. I think a sieve worked on the parallel principle would carry the wheat and chaff much faster, and a sieve of the lip type with $\frac{1}{4}$ in. openings would let less white-heads come down in front. The elevators usually attached to winnowers are too high, and they make the machine much heavier to turn. If the shaking screens were altogether dispensed with and only the long screen attached it would be an improvement. The knocker attached to the bottom of the screen to keep it free from grains of wheat might with advantage be fixed, say, a foot from the top, where it would be of more service. The action should be where the wheat falls and not from below. It was somewhat puzzling to know why machines apparently built in the same way vary in wind power. Possibly the shape of the arms and the position of the drums may be the cause. Wind power in a winnower is a most important factor, the qualifications of the machine being largely dependent on this point.

The Hon. Secretary considered many winnowers deficient in wind power; there was great variation in this point with machines of similar construction. Mr. Caughlan considered the winnowers of twenty-five years ago, although not so elaborate as those of modern make, were as a rule superior to the latter. Mr. Hombach considered the screens in some winnowers too flat; he agreed that the elevators could be made lower than usual. Mr. Potter gave an instance where men doing piece work did better and more work with an old machine without an elevator than they did in the same time with a new one with elevator attached. Most members referred to points susceptible of improvements. In some the grains of wheat were carried into the drum, the sieves in others are too far from the fans, and wind power is thus sacrificed. Misdirection of the wind was also a fault with some machines; winnowers were often too long in the build. The half-screen was condemned as being too lengthy and blocking the wind, they were also too heavy. The fault in the regulating screen was in the carrying out of the design, the trouble being mostly in the bracket that carried the operating arm. The wirework on the screens should reach the top and the flow of wheat regulated to cause an even

flow down the screen. The closer the fans worked to the drum the better. Mr. McRitchie said there was considerable difficulty when the crops ripened too rapidly, and the grain being light was difficult to separate. This year he used a zinc sieve, with $\frac{1}{4}$ in. round perforations. He also had a travelling screen attached, and the work was satisfactory. The chairman mentioned a number of improvements he had made to winnowers, several of which had been tried with satisfaction in the district. One of the main improvements was to convey the wind direct to the sieves, the back of the machine being completely closed. He claimed for his winnower that it put through double the quantity in a given time that the ordinary machines did.

Morgan, May 17.

Present—Messrs. R. Windebank (chair), H. Hahn, F. G. R. Wohling, H. Wohling, E. Hausler, W. G. F. Plummer (Hon. Sec.), and seven visitors.

PROFITABLE USE OF THE LAND.—Mr. Hahn read a paper on “How can we Profitably use Land out of the Line of Rainfall?”

The question as to what use the land in this district can be put, with the very scanty rainfall experienced of late, is exceedingly difficult to answer. He believed the rainfall at Morgan during the past seven years had averaged only about 5 in., and under such conditions it was impossible to make a living off 2,000 to 3,000 acres of land. His experience of wheat growing was not encouraging. During the past seven years he had put in about 2,000 acres, for a total yield of 2,080 bush. Some of the seed was worth 5s. to 6s. per bushel, and the yield only 2s. 8d. a bushel. Then what good is it for grazing under such conditions? Stock do well when there is any grass; but a total of 5 in. for the year, of which some falls during the dry part of the year, will not give much grass. He maintained that it would take 300 acres where there was no saltbush and plenty of mallee scrub to keep one head of great cattle for the year. There is bluebush in parts, but this is not of much value, as it accumulates and forms balls in horses' stomachs. Grazing, even at the low rent of £2 per square mile, will not pay on a small scale, and even on a larger scale success would be very doubtful. The only way to profitably occupy the land was to let it in blocks of thirty to forty square miles, at about 6s. per mile. Angora goats were reputed to be very hardy, and if they would browse on the young mallee and other bushes possibly the best thing in time of drought would be to breed goats and rabbits. In reply to question, he thought on even twenty square miles they might make a living, taking good seasons and bad, by having plenty of paddocks and reserving the feed on some of the paddocks. He would only stock the land very lightly.

Mr. Wohling said he had a paddock reserved for feed, the dry grass being 9 in. high. A sharp storm occurred and all the feed was washed away. The question of losses of cattle was referred to. Mr. Hahn did not think “dry bible” was the cause. Mr. F. R. Haupt attributed losses to “dry bible,” caused by eating fibrous matter containing little or no moisture. The wild-melon was suggested by some as being injurious, but Mr. Windebank said his cows ate them readily and were almost dependent upon them for their living at present. Mr. Hausler tabled piemelons weighing 49 lbs. each, grown during the past summer on sandy land not irrigated.

Reeve's Plains, May 16.

Present—Messrs. W. H. George (chair), J. G. Folland, J. Dawkins, W. S. Corden, W. Cawse, W. Day, H. Day, E. Hancock, W. G. Payne, M. Richter, A. Arnold, P. Marshall, J. J. McCord (Hon. Sec.), and a number of visitors.

ENSILAGE.—Mr. C. F. Jarman, manager Roseworthy College, read a paper on this subject, to the following effect:—

Silage is a process by which green fodder can be preserved so that it retains a large percentage of its feeding value, and which comes out of the pit or stack, in the hottest weather, moist, succulent, and digestible—a boon to all farm stock. Though horses and sheep could

with advantage be given a little silage in summer, there is little doubt that it is more suitable and better serves its purpose when fed to dairy cows, as it increases the flow of milk, hardens the butter, and keeps the cows in better coat. I am of opinion that silage prevents impaction in cattle, as we have never, to my knowledge, lost any cattle on the college farm with that particular ailment. Therefore if feeding silage to cattle prevents impaction it certainly is a point in its favor when counting the cost of making. I have never noticed any ill effects from its use, although it is said to rot the teeth. This, however, is a mistake, as I have looked carefully at the teeth of the cows that are fed on silage every year, and can find nothing to show that it is injurious in this respect. It is also said that silage will taint milk and butter. This may be the case when sour silage is fed, but it certainly is not when it is sweet. The difference between sour and sweet silage is that, in the case of sweet silage, the temperature must rise to or over 120° F., while sour silage is obtained when the stuff is simply put in the pit or stack as quickly as possible without waiting for the temperature to rise. There are two ways of making silage. One is to stack it on the ground in the way one would build a loose hay stack, and either weight it with dead weight or by mechanical pressure. Mechanical pressure, however, is faulty, as it is not continuous. Dead weight is very awkward on top of a stack, as it is liable to pull the stack over; and there is more waste in the stack. The other, and I think the best, way is in a pit, dug out and built up with stone or brick and lined with cement. One of the greatest drawbacks is the work of getting silage out when feeding. In some places this could be partially overcome by making a silo on the side of a hill or in the upper banks of a creek, leaving an opening about 3ft. wide and about 10ft. down the centre of the wall on the down-hill side, this opening to be closed, as the pit is being filled, by 6in. x 3in. jarrah, 3ft. 6in. long. These planks could be removed as the silage was being taken out, and in this way the weights used for pressing the stuff could be easily removed from off the pit and the silage thrown through the opening. A useful silo for a small farm would be 12ft. x 12ft. x 15ft. deep, allow wall to be built up 4ft., or even 5ft., above surface. This serves a double purpose—prevents sand from drifting in and keeps stock from falling down. In this country a roof is not absolutely necessary, though doubtless an advantage, and could be made in two sections, to lift off, at a small cost. A roof would prevent water from getting in in the winter, which would probably crack or damage the pit. A pit 12ft. x 12ft. x 15ft. should hold, when full, from 25 to 30 tons, which, apart from any other test than general feeding, I think would be quite equal to that weight of hay. I have this year cut a cubic foot from about half way down the mass of silage, and found it weighed 43lbs. This was after standing with weight on for six months. If the stuff were chaffed into the pit it would likely hold about half as much again, or say 40 to 50 tons. My experience goes to show that stuff for silage should be cut while on the green side rather than the dry. If left standing too long it becomes hard and does not go together in the pit as it does if fairly green; the consequence is that it is a harder matter to exclude the air, and the silage is more likely to go bad. I would advise cutting about a week after the bloom has fallen, and stuff has reached its full height. Fortunately this happens when there is likely to be a slack time on the farm, if such can be said about our line—the time when the fallowing is done, the scarifying finished, and there is a lull before the busy time of haymaking.

There are usually a few patches on the best farms of one or more of the following: Wild oats, charlock, poppy, dandelion, or cockspur, each of which, provided there is 50 per cent. wheat or oats among them, will make fairly good silage; and in cutting out these patches surely one is doing satisfactory work in that it is cleaning the land of a number of weeds, bettering the sample of the remaining crop (whether cut for hay or left for grain), and making good food of that which would otherwise have been wasted. Cart the stuff as soon as cut, not leaving it any longer down than you can possibly help, in fact cut out small patches with cutter, and keep right up to it. It will be found very awkward to keep close to mower if that machine is allowed to go around a large piece, as there will be a lot of shifting about to get a rake full of stuff at a place. It is a great advantage at the season of the year when we often get damp days that it need not interfere with the making of silage, as, unless it is raining hard, the silage can be put in the pit with safety. The first day of cutting put into silo about 4ft. of stuff and sprinkle about 2lbs. of course salt over each load. This may with advantage be continued all through the pit. Care should be taken to spread the stuff evenly in the pit, and it will pay well to keep a man below treading it down. Where the stuff falls into pit it will not require tramping, as that spot will become solid enough. A point between it and the wall, however, will want constant attention, as it will lie very loose close to wall and behind the spot where the stuff is falling. Leave the pit until temperature rises, which will be about two days, or perhaps not so long. Take temperature with an ordinary dairy Fahrenheit thermometer. The best plan, I find, is to get a crowbar and drive it into stuff, pull it out, and lower the thermometer down the hole with a string. When the temperature has reached 122° F.—it will not harm if it goes nearer 140° F., but must not exceed that, or silage will blacken and char—put on another layer of green stuff, and again wait for temperature, which should rise more quickly than the first layer; repeat this until pit is full. Fill pit about 4ft. or 5ft. above the edges, as it will sink. A good plan before starting to cart after

the first layer is in is to get all hands available on the farm, and thoroughly tramp it for four or five minutes. This will enable you to get it more solid as the pit is being filled, consequently more can be got in silo. Usually about a foot of the top will go bad unless some means are taken to prevent it. A good plan, I find, is to put about a foot or more of straw on top of the silage. This brings the loss from that source down to a very little. As soon as the temperature has risen sufficiently high in the last layer, then put on the weights. I cannot advise too strongly the need of being most particular in this all-important part of the process. If there is not sufficient weight put on the pit, then there is one thing you are very sure of, and that is "bad silage." The weight to be used should be at least 1 cwt. to the square foot, or on a pit 12ft. x 12ft., 7 tons 4 cwt. Jarrah boards, 6in. x 2in., to lay on top of straw on which to put the weights, are a decided advantage, but, like the roof, not absolutely necessary. Almost any weighty thing can be used, such as kerosene tins filled with concrete or sand, posts, logs, mallee roots, hard stone, sand in bags (the best of the old manure bags will do for this purpose); but whatever is used it should be carefully weighed, so as to be sure that you have got the right weight on the pit. The best time to use the silage is from about the 1st of January on to the end of April.

Mr. Folland had made silage, but the amount of labor involved was a great drawback. Some of his ensilage was quite black, but the cows ate it readily. He considered bran, when cheap, would take the place of ensilage. Mr. Dawkins had fair success, using dandelion (Cape marigold), clover, and wild oats, which, in his opinion, made better silage than wheat. He put on what weight he considered sufficient, and never bothered to weigh same. Bran was not so good as ensilage, it was not a succulent food. Mr. Marshall had good results from both pit and stack ensilage, but there was too much labor involved in making ensilage. Mr. George considered ensilage should prove of great value in this district, as without something succulent for the cows to eat during the summer it was next to useless to attempt dairying. By cutting the weeds before they seeded and converting them into ensilage they helped to clean the land. It was resolved that in the opinion of this meeting every farmer should make ensilage for his dairy cattle.

IMPACTION.—Mr. Folland said that farmers treating stock for impaction need not be afraid to give Epsom salts freely. He had given a young beast three doses in thirty hours—the first in the morning, then another at night, each dose being 16ozs. As these did not have the desired effect, he gave her 24ozs. next morning, with result desired, and the beast was now all right.

Morphett Vale, June 4.

Present—Messrs. H. Smith (chair), R. Binney, J. Bain, T. Anderson, J. McLeod, A. Jones, A. Pocock, and A. Ross Reid (Hon. Sec.).

VINEYARD CULTIVATION.—Mr. Binney reported on trial of Massey-Harris nine-tine vineyard cultivator. Although the ground was dry and unploughed the work done was very satisfactorily; the ground was well worked to depth of 3in., and the vibration of the spring-steel tines shook all weeds free of dirt. Members generally recommend this class of implement for use in vineyards and on farms. The Hon. Secretary said they could be improved by lessening their cutting width to 3ft. 9in. In this district the vines were mostly in 8ft. rows, and a round with a 3ft. 9in cultivator covered the workable ground nicely. The wide cutting machines were heavier, and worked the middle part twice. It was decided to arrange for working trial of various classes of scarifiers, members to send implements for testing.

PRUNING MUSCATEL VINES.—Mr. Binney said the ground round some of his muscatels had silted up considerably, and a large proportion of the crop was lost through rotting. He asked whether rod-pruning was advisable. Mr. Anderson had tried rod-pruning for muscats, but would not advise the practice. The Hon. Secretary would put the vines on wires and prune as a spur-pruned

cordon. When pruning take a strong shoot of upright growth, leaving it full length or nearly so; carry this up perpendicularly till it reaches the wire at 2ft. from the ground, then bend sharply at right angles and tie to the wire. The Hon. Secretary read a short paper on vine-planting, urging members to plant vineyards.

ABNORMAL BLOSSOMS.—Several members reported fruit trees to be blossoming in different localities to a limited extent. They wished to know whether anything should be done to the trees. [Leave the trees alone. Probably the blossoming is due to the mild weather following on the check received from the wind last January.—GEN. SEC.]

Forster, June 1.

Present—Messrs. J. Retallack (chair), F. Towill, W. Johns, F. Johns, A. Johns, J. Johns, and John Johns (Hon. Sec.).

SORE SHOULDERS.—Mr. J. Johns, in order to prevent horses getting sore shoulders, recommended that, when starting fresh work such as seeding or stripping, the animals should work only four hours at first, and increase the time a little each day, until they have to work eight hours a day. The shoulders should be cleaned every morning with comb and brush, also the collar cleaned and all hard places removed by rubbing or other means. Do not feed too much boiled wheat, but feed them well. Two gallons of boiled wheat with a gallon and a half of pollard with cocky chaff is sufficient for five horses. If horses are worked after sundown they sweat more than at any part of the day, which is bad for the shoulders.

Koolunga, May 22.

Present—Messrs. T. B. Butcher (chair), J. Button, E. J. Shipway, J. Sandow, G. Jose, J. Butterfield, W. Aunger, T. Freeman, R. Lawry, R. Palmer, J. C. Noack (Hon. Sec.), and one visitor.

IMPROVEMENT OF WHEATS.—Mr. R. Marshall's paper in December issue of the Journal was discussed, and the necessity for improving the quality of our wheats generally admitted. Several members expressed the opinion that the best course for the average farmer was to select the best heads for seed purposes and keep on improving in this way. Mr. Butcher thought it might be desirable to obtain from New South Wales, for trial, some of the wheats reputed to be high in gluten contents.

PICKLING WHEAT.—Mr. Butcher called attention to recommendation of General Secretary to pickle wheat in a tub or cask and float off the bunt balls, and asked whether any of the members had been able to float bunt balls as suggested. All those who had tried pickling by dipping had failed to make bunt float to any extent.

Mount Bryan East, May 17.

PRESENT—Messrs. B. H. Dunstan (chair), T. Wilks, E. Wilks, J. Thomas, W. Quinn, and W. Dare.

OPHTHALMIA.—Mr. Thomas reported a number of his sheep to be blind. The eyes became inflamed, and a white film came over the eye. In some cases a spot of humor was seen. Members wished to know whether the complaint was infectious, and how to treat. [Bathe the eyes occasionally with

4ozs. tincture of opium to a quart of warm water. If only a few sheep are affected, keep in a dark place until better. Yes; ophthalmia is distinctly contagious.—GEN. SEC.]

SHEEP MANURE.—Mr. T. Wilks wished to know how much rotted sheep manure per acre it was advisable to drill in. [The ordinary drills worked to their fullest capacity would not sow more than, say, 1½cwt. to 2cwt. Several hundredweights per acre could be applied.—GEN. SEC.]

Mundoora, May 23.

PRESENT—Messrs. R. Harris (chair), J. Loveridge, F. Beck, W. Aitchison, J. Blake, D. Owens, C. Button, W. Mitchell, W. D. Tonkin, W. J. Shearer, A. E. Gardiner (Hon. Sec.), and one visitor.

SMALL SEED.—Discussion took place on question of sowing small seed. Members were agreed that a very fine tilth should be secured if small seed is to be sown, and that, if favored with a good soaking rain at the start, there would be little difference in the crop compared to crop from large seed. It was admitted, however, that with only a light rainfall at the commencement of the season, large plump seed gave the best returns.

IS FARMING PROFITABLE?—After giving the various papers read at Bureau meetings careful consideration, members were generally of opinion that, under present labor conditions, farming, with wheat at 2s. 6d. per bushel, did not pay, but they thought a farmer blessed with industrious sons and a fair average crop would earn fair interest on the money expended.

MAKING BUREAU MORE USEFUL.—The Chairman called attention to paper by Mr. Coulter, of Orroroo Branch (page 882, *May Journal*), which, in his opinion, contained much good sound advice. If members would study the paper, it would doubtless lead to much more interest being taken in the Bureau work.

Gumeracha, May 26.

Present—The Chairman and a large number of members and visitors.

HOMESTEAD MEETING.—Members met at Mr. W. A. Lee's residence and inspected the homestead and orchard. The different kinds of trees, methods of pruning, grafting, spraying, &c., were discussed in the orchard. Mr. Jamieson initiated a discussion at the evening meeting on "Things left undone that ought to be done on the farm." He insisted on the necessity for providing shelter for cattle, and also of keeping up a kitchen garden; flowers should also receive attention when possible. A lively discussion on the subject took place, and the meeting closed with vote of thanks to host and hostess for their entertainment of the visitors.

Redhill, May 20.

Present—Messrs. D. Lithgow (chair), D. Steele, R. H. Siviour, A. A. Robertson, W. Stone, F. Wheaton, L. R. Wake, J. N. Lithgow (Hon. Sec.), and one visitor.

"MACHINERY IMPROVEMENTS AND CARE OF."—Mr. A. A. Robertson read a paper to the following effect:—

In 1855 farmers worked the single-furrow plough, wooden harrows, the sickle, reaphook, and scythe, sowed by hand and thrashed with flail or roller, or treaded the grain out by cattle or horses. Now they use stump-jumping implements, and eight-furrow ploughs, in preparing the

soil, and complete harvesters, and yet all this makes no difference in the labor difficulty. As improvements proceed the dealers and consumers get all the benefit. The make of the wheels of machines is of great importance. The Victorian hub should be fitted well to the South Australian bluegum felloes with New South Wales ironbark spokes. To save wear and tear, belts should be run long where possible and kept soft with a little oil on the outside, and use some dry resin on the inside if they slip. Run all parts well up in gear; do not allow the cogs to run on the tops, as that would cause heavy draught and bad wear. All bearings should be well cleaned before starting work after a period of idleness. Iron implements must be painted occasionally to lengthen their lives. After exposure for a time iron becomes brittle and weak.

Members considered that improved machinery increased the demand for labor and makes labor more profitable and pleasant.

Millicent, June 5.

PRESENT—Messrs. H. F. L. Holzgreffe (chair), H. A. Stewart, A. E. J. Hutchesson, H. Warland, W. B. Crouch, H. Oberlander, R. Campbell, B. Varcoe, J. Davidson, H. Hart, A. McRostie, and E. H. Harris (Hon. Sec.)

CONFERENCES.—*Re* proposal to divide South-East into two sections for purpose of holding an annual conference of Branches in each one. Mount Gambier, Kingston, Tatiara, and Millicent favor the idea; Naracoorte and Lucindale object; and Penola has not answered.

SUPER. ON GRASS.—In answer to inquiries it was stated that the broadcast seedsower would scatter superphosphate fairly well on grass land, if there is no wind; but the better way would be to remove the hoes and tubes from a seed drill, and let the super. fall on to a sloping board.

CROWS AND MAGPIES.—Mr. Varcoe said he had killed several magpies and found a lot of germinated wheat in their crops. Crows were also guilty of the same practice. [It is illegal to destroy magpies.—GEN. SEC.] Several old methods of poisoning these birds were mentioned. Coal tar on the grain was recommended as a deterrent.

EXHIBITS.—By Mr. A. McRostie—a quantity of cauliflower plants for distribution. By R. Campbell—well-grown new potatoes from sets planted February 14; green rye, over 4ft. high, sown same date on poor sandy land, treated with 2cwt. super. and 1cwt. sulphate of potash; the rye was ready to cut on May 1.

SEASONABLE WORK.—Mr. Hart said it was not too late to sow common clover, and milling barley could be sown up till August.

Mount Pleasant, June 13.

Present—Messrs. G. Phillis (chair), W. Lyddon, P. Miller, J. Maxwell, H. Dragomuller, J. A. Vigar, W. Royal, V. Tapscott, J. F. Miller, and H. A. Giles (Hon. Sec.)

ANNUAL MEETING, &c.—Chairman and Hon. Sec. thanked and re-elected. Seven meetings held during past year, average attendance, eight; on roll last year, eight members, now eleven.

"SHOULD WE FALLOW."—Hon. Sec. read a paper by Mr. F. Thomson, to the following effect:—

Fallowing has been practised by farmers from time immemorial. In the north and south of South Australia large areas are thus treated, and some very successful farmers never crop except on fallow; but very little is done in South Rhine. Why not? Some say it does not pay. Others want the grass for their stock, and some argue that fallowing does not increase the fertility of the soil, but does give a greater crop of weeds and rubbish. If fallowing does

not pay, it is a sufficient reason against it. The man who wants grass on his land is more of a grazier than a farmer. As to the third objection—all past experience goes to prove that proper fallowing does increase the fertility of the soil by increasing the availability of the plant food. Our present want of system in growing wheat gives such poor and unsatisfactory results that many are giving up wheat and turning to sheep and cattle. Small farmers are selling out to neighbors, and lands that should maintain scores of farmers in comfort are being converted into sheepwalks. Some system of rotation must be adopted. Climatic conditions and markets will not allow us to adopt the English system. He suggested that the farm should be divided into ten paddocks; fallow one each year, plough it well, harrow and scarify at intervals; thus, even if rain holds off, it will be ready for the drill at seed time; with the aid of manure three crops of wheat, one of peas, and a cut of cow hay, might be secured before it is again laid down for pasture. The farmer would thus get better and cleaner crops than he does now, could keep more stock, and do the farm work with less horsepower than at present. Seldom is a really clean crop seen under present conditions of cultivation, because tillage is hurried when the rains fall at end of autumn, as the hard-baked soil cannot be worked until then. The result is an abundant crop of wild oats on a shallow-ploughed field, which cannot be worked early next year if required. A properly fallowed field would be ready for the drill at any time, and can be re-ploughed next year as soon as the crop is off, without having to wait for rain. He suggested the following rotation after fallow, viz.:—First two crops to be wheat for grain or hay; third crop, peas or other pulse; then a grain crop, followed by a fodder crop for silo or laystack. This course would result in better and more profitable wheat and hay crops, more fodder off the cultivated land, and better and more grass on the pastures.

Members could not recommend fallowing generally in South Rhine, except suitable portions, but strongly advocate the practice in dry country. It is considered best in South Rhine district to take only two crops in succession off the same land.

Davenport, June 5.

PRESENT—Messrs. W. J. Trembath (chair), J. Roberts, T. McDowell, A. McDonald, F. H. Pybus, T. Trotman, J. Holdsworth, J. E. Lecky (Hon. Sec.), and one visitor.

MANURES FOR HOME GARDENS.—Mr. Pybus read a paper, of which the following is the substance:—

Farmyard manure differs. That from young stock contains less phosphate, &c., than that from older animals, which do not require ingredients for building their bones and body. Manure placed in pits is richer than that which has been put in heaps, where a loss of about 5 per cent. occurs in forty days. Pigs' manure contains much water and not much nitrogen, develops little heat in decomposition, and yields but little ammonia. Hen manure is much richer than that from geese, because the latter feed largely on grass. Guano from Peru contains a lot of nitrogen. One ton is equal to $3\frac{1}{2}$ tons of ordinary farmyard manure, or 21 tons of horse dung, or $38\frac{1}{2}$ of cow, or $22\frac{1}{2}$ of pig. Pulverised brick and hardwood cinders make an excellent soil for growing ferns and some other pot plants.

GERMINATION OF SEEDS.—Mr. Pybus also gave some notes on this subject to the following effect:—

All of the Brassicaceæ (cabbages, kails, radish, rape, turnips, &c.), if well grown and ripened, will germinate 90 per cent. at three to five years; carrot and parsnip, 70 per cent. to 80 per cent. from one to two years, after that seldom more than 10 per cent. to 20 per cent.; lettuce, 80 per cent. up to four years; cucumber, melon, &c., will often germinate up to ten years; peas, 100 per cent. up to three years; beans, 100 per cent. first year, 50 per cent. after that; beet and mangold good for seven years or longer—there are from two to four seeds in each capsule; onions, parsley, clover, 80 per cent. to 90 per cent. first year; second year, 15 per cent.; fourth year, scarcely any. Oily seeds are amongst the most quickly perishable; starchy seeds are the most durable.

Mr. McDowell thought farmyard manure was richer than generally supposed. Pits were best for storing it, because ammonia is conserved. New manure dug in, left three or four months, then dug over again, gave better results than old manure of same bulk. Liquid manure made with fowl dung gave best results with him. He had grown lettuces up to 4lbs. with that; and with cow manure (liquefied with water) he had cauliflowers up to 14lbs. each when trimmed off.

leaves. Chairman referred to a solution of one part of camphor in ten parts of water as being used to renovate old seeds. He had raised some very strong plants from old seeds by this method.

WOOD ASHES FOR HORSES.—Mr. McDonald read the following clipping from the journal of the Jamaica Agricultural Society:—

Clean wood ashes are better than all the condition powders for the farm horses; in fact, many of the so-called powders are composed chiefly of salt and wood ashes, mixed with probably something else of minor importance. This being the case, I find it much cheaper and easier to administer the wood ashes direct. The ashes can be given to the horses twice a week in their oats at the rate of an even teaspoonful each time. If given carefully and regularly, I believe that no other medicine would have to be given to horses that are fairly treated and cared for. Everyone familiar at all with farm matters must have observed certain habits in many horses and cows to gnaw wooden posts, trees, and similar objects. This craving for something which they do not get from their daily food is satisfied when wood ashes are administered regularly to them. It is just as natural for the animals to desire this as it is for us to have a craving for acids, salt, and even pepper.

Port Pirie, June 14.

Present—Messrs. T. Johns (chair), H. B. Welch, T. Bell, T. Gambrell, G. M. Wright, W. Smith, F. Humphries, G. Hannan, P. J. Spain, R. J. Ferry, T. A. Wilson (Hon. Sec.), and one visitor.

"PASTORAL INDUSTRY, ORANGE RIVER COLONY."—Mr. Ferry read a paper on this subject. He highly appreciated the capabilities of this industry in that part. The Boers amassed wealth, but their management was bad. Stock of all kinds were left to roam the veldt, and the bulls, stallions, rams, &c., left with the herd all the year, with consequent deterioration. The animals that survived under these conditions were hardy. Cattle were practically all of one breed—the Red Africander—and good in beef, and rich milk in plenty. Herbage abundant during nine months, and not very scarce for the rest of the year. A considerable number of diseases and pests prevalent amongst stock, and practically nothing done to stop them, except in respect to rinderpest. Horse stock not generally above mediocrity, and sheep are inferior. Angora goats are bred in numbers, and make a thriving industry.

Maitland, June 14.

Present—Messrs. J. N. Smith (chair), T. Bowman, H. Bawden, J. Hill, C. Heinrich, E. Moody, J. Kelly, H. G. Tossell, and W. Bowey (Hon. Sec.)

OFFICERS.—Officers thanked. Chairman and Hon. Secretary re-elected. Mr. T. Bowman to be Vice-chairman. Satisfaction expressed with increased interest in work of Branch.

AGRICULTURAL IMPLEMENTS.—In discussion Mr. J. Kelly referred to the harvester. It was unwise to discard present implements extensively, as some had done, until they were fully satisfied that the new ones would answer fully and were durable. He would like to see a large winnower introduced to be driven by an oil engine, as it was too hard work for a horse. He would have saved half the cost last season through the perfect thrashing of the heads and whiteheads. He did not agree with ploughing back fallow, because it brought to the surface soil that had been turned down. The cultivators, so far, were inadequate. He preferred the scarifier, but it required to be improved, especially the stump-jumper, in its bearings. Mr. Heinrich said he had used the large winnower with a horse, but it was not hard on the horse, especially if he were a large one; still it might be better worked with an

engine. It was a great saving in the cleaning of the wheat, and avoided waste. It was easily fed, and would put through twenty-five to thirty-five bags per hour with good stuff and handy. With the harvester work could be commenced early in the morning. There was very little wear in the bearings, and none extra in the pinions, when the work done is considered. Blacklead reduced the wear considerably.

Mount Gambier, June 17.

Present—Messrs. M. C. Wilson (chair), W. J. C. Clarke, J. C. Ruwoldt, J. Dyke, J. P. Kennedy, D. Norman, sen., J. Watson, W. Barrows, J. Bowd, T. H. Williams, Geo. Bodey, and E. Lewis (Hon. Sec.)

PECAN NUTS.—The Hon. Secretary placed some pecan nuts (*Carya ovaliformis*) on the table. They had been received a year or more since from Central Bureau, and were mislaid. They should be planted 3in. deep, in a moist locality, where water exists at a short depth below.

NEXT MEETINGS.—Resolved to accept an invitation from Hon. G. Riddoch, M.L.A., to meet at Koorine next month.

SWAMP MUCK AS A FERTILISER.—Mr. T. H. Williams mentioned that some farmers had been carting out sedimentary matter from the dried up swamps with beneficial results to the adjacent land. Mr. Wedd said results varied; in some cases no benefit had been derived, whilst in others some very good effects followed. Perhaps the results would be realised later on where none were observed at first. The eastern sides of swamps were always much richer than the west owing perhaps to drifted vegetable matter and westerly winds. Some members thought chemical manures would be more economical and satisfactory on the whole, but opinions differ.

BLACK SPOTS IN POTATOES.—Mr. Watson said there had been many complaints about black spots in potatoes this season. Mr. Bodey said the trouble was prevalent at Glencoe, but not on the sandy land. He had noticed it at digging time, and some time after it had entirely disappeared. Mr. Bowd thought it was caused by dry weather. Mr. Norman said it was prevalent in all varieties of potatoes, both in rich and poor land. Mr. Edwards said his experience in growing potatoes was that they should be left in the ground until they had a thorough soaking. Under this condition he was able to keep his up till September, and they were always marketable. He had not seen black spot amongst his potatoes when planted about October.

Kadina.

Present—Messrs. T. M. Rendell (chair), D. Taylor, H. Kennett, H. Johnson, T. H. Warren, D. Kennedy, M. C. Quinn, S. Small, S. Roberts, and J. W. Taylor (Hon. Sec.).

BUSINESS.—A number of subjects of little interest to other Branches were dealt with. It was desired that the Chamber of Commerce should fix the standard of average quality of the season's wheat earlier. Mr. Taylor mentioned that Messrs. Freeman and Lohmann had grown marrows, melons, tomatoes, &c., on less than an acre of land to the value of £40 with the aid of Beetaloo water, which helped to pay the water rates. Mr. Kennedy tabled some very fine potatoes, grown with aid of water from Beetaloo.

OFFICERS.—The Chairman, Vice-chairman, and Hon. Secretary were thanked and re-elected.

Gawler River, May 23.

Present—Messrs. J. Badman (chair), H. Roediger, R. Badcock, J. Hillier, E. Winckel, T. P. Parker, A. M. Dawkins, F. Roediger, C. Leak, A. Bray (Hon. Sec.), and one visitor.

POULTRY COMPLAINTS.—In reply to question, Mr. H. Roediger said for pip in fowls he would advise scraping the tip of the tongue of the affected fowl. For disease causing mopishness and subsequent death Mr. Parker had found cholera drops a good cure. For diarrhoea in fowls a few drops of Friar's balsam and chlorodyne mixed in pollard were recommended. The lack of green feed was thought to be the cause of much trouble with fowl complaints.

PRESERVING EGGS.—Mr. Dawkins strongly recommended the use of water glass as a preservative for eggs.

SOLDERING BY AMATEURS.—Mr. Dawkins initiated a discussion on the use of the soldering iron by amateurs. It was very handy to the farmer to know how to use the soldering iron. Galvanized iron was the easiest to solder; for brass a little zinc should be added to the spirits of salts. Black iron could be soldered by filing the iron bright and then tinning it, after which a piece of tin could be soldered over the hole. This was a very effective way of repairing leaky iron pipes. To solder pewter a very cool iron should be used, or else just let the solder drop slowly on the material. For galvanized iron use clean spirits, or for cleaning dirty spots. For most other purposes it was necessary to kill the spirits by adding a little zinc. The quickest and easiest way to clean a soldering iron after taking it from the fire was to dip it in a mixture of sal-ammoniac and water. Mr. Kippin, a visitor, recommended using a feather for applying salts in preference to a brush. For small jobs he used a mixture of killed spirits and water. He cleaned his iron by making it red hot, rubbing it over with a rough file or rasp, and then dipping it into a mixture of killed spirits and water. Care should be taken to avoid inhaling the fumes of spirits when dissolving zinc, as they were poisonous. Mr. H. Roediger recommended using resin for flux when soldering honey tins, or such like, as there was a danger of the salts poisoning the contents.

MODEL OF MACHINE FOR TAKING UP OLD FENCES.—Mr. Kippin introduced a model of a machine for coiling barbed wire, pulling up posts, &c., of his own invention, and presented it to the Bureau. Members were greatly interested in the model, and thought it a very useful invention, and a hearty vote of thanks was accorded to Mr. Kippin for his model and explanation.

Cherry Gardens, June 10.

Present—Messrs. W. B. Burpee (chair), T. Jacobs, C. Lewis, J. Lewis, G. Brumby, A. Broadbent, G. Hicks, W. Gardner, J. Richards, and C. Ricks (Hon. Sec.).

OUR INHERITANCE IN THE HILLS.—Mr. Ricks read a paper on this subject to the following effect:—

In travelling through our hills one cannot fail to be struck with the great variety of soils and the possibilities of the profitable production of fruit of all kinds. On our hill slopes strawberries grow to perfection; in the sheltered gullies raspberries and currants. The orange and lemon will flourish, and much of the land now looked on as of little value will produce raisins and currants in the future. Then the land will produce apples, pears, and other fruits of the highest quality. And there was room for increased production on all these lines. Raisins and currants are still imported; fresh fruits are still a luxury except for a very short season to most people; oranges and lemons are imported in large numbers to meet the demand for them. Instead of fruit being a luxury it should be partaken of at every meal, and less meat eaten. There is besides much scope for increase in our export trade. True, at times fruit is very cheap, and for a season may be unprofitable to the grower; but this is largely due to

faulty methods of distribution. Care must be taken to plant the varieties of fruit suitable to each particular soil and locality. Landowners would do well to encourage their tenants to plant trees by granting long leases on reasonable terms. If this were done, instead of there being hundreds of acres covered with briars and scrub, there would be numerous homesteads with profitable gardens attached, and our boys and girls instead of being compelled to drift to the towns would be able to settle on and get a living from the land. As producers they would help to keep the State prosperous, whereas without land to settle on they were a source of weakness. Of course, the old story of overproduction will be brought up, but he contended that so long as thousands of their fellow men were unable to obtain at a reasonable price as much fruit and other produce as they need, there could be no real ground for doubt as to the disposal of such produce. Admitted that at times there was a temporary glut in some lines of produce, it was mainly the fault of their system of distribution. Co-operative factories in the fruit-growing centres for packing fruit for export, and for drying and preserving fruit suitable for the purpose, and co-operation in the distribution of the produce as direct as possible and at reasonable rates would solve the problem of overproduction.

Koolunga, June 19.

Present—Messrs. T. B. Butcher (chair), J. Button, E. J. Shipway, R. Lawry, J. Sandow, W. T. Cooper, J. W. Atkinson, G. Jose, C. J. Allen, T. Freeman, J. C. Noack (Hon. Sec.), and two visitors.

QUESTIONS.—This meeting was devoted to the question-box.

WILD OATS.—Q. Will wild oats grow after having passed through the stomach of a horse?—Yes; in many cases these and other seeds will germinate, especially if the animal is old, or has eaten greedily. One member said experiments had proved the contrary.

WATER-BRASH IN HORSES.—Remedy required? Some members suggested irregularity in the teeth, or some foreign matter in the throat. [Some further particulars of the symptoms would, perhaps, have enabled me to have inquired of a competent authority as to remedy.—GEN. SEC.]

COW-FOX.—Remedy required? [Isolate the affected animal and wash the parts daily with weak carbolic solution; then rub on a little vaseline and carbolic oil.—GEN. SEC.]

RINGWORM ON HORSES AND CATTLE.—[Isolate each affected animal, clean the affected places carefully with soap and water, shave off the hair if possible, dress the places with tincture of iodide, or solution of chloride or sulphate of zinc, or perchloride of iron.—GEN. SEC.]

FARMERS' UNION.—Members strongly favor a powerful co-operation amongst farmers in preference to several small and weak unions, as was recently advocated at another Branch meeting.

Yorke town, June 14.

Present—Messrs. J. Koth (chair), A. Jung, C. Domaschensz, J. Latty, C. Anderson, J. H. Thomas, A. E. Anderson, and John Davey (Hon. Sec.).

GRIPES IN HORSES.—Hon. Secretary noted mistake in *Journal* for June. The treatment should be homœopathic—Arsenicum five drops, and nux vomica five drops alternately at five to fifteen minutes. In Mr. Bull's estimate of cost of growing an 8-bush crop of wheat the word "pickling" was printed in place of "stone picking." [The first mistake was the Hon. Secretary's, the other was mine.—GEN. SEC.]

MANURE AND SEED.—Some wheat crops that had been sown early with super. have come up rather thinly, and a question was raised as to the probability that the effect was due to the grain having remained in contact with the manure for a rather long period before germinating. After examination members could not decide the question, but thought there would be no necessity to resow the land. [Is it possible that the thinness of the crop may be due to the malting of the seed?—GEN. SEC.]

Inkerman, June 17.

Present—Messrs. W. Fraser (chair), R. Kennedy, C. H. Daniel, D. Fraser, F. C. Smart, C. E. Daniel (Hon. Sec.), and two visitors.

ANNUAL REPORT.—The Hon. Secretary's annual report showed that during the year ten meetings had been held, with an average of seven members. Messrs. James Sampson and W. Fraser were elected Chairman and Vice-chairman respectively, and Mr. C. E. Daniel re-elected Hon. Secretary.

CLEANING DRILLS.—A short discussion took place on cleaning seed and fertiliser drills. Several members advocated liberal use of kerosene for cleaning the super. from the feeders and other parts. Those who have used the disc drills consider them a great improvement on the hoe drill as far as this district is concerned.

Port Lincoln, June 19.

Present—Messrs. W. Laidlaw (chair), J. Anderson, J. D. Bruce, G. Dorward, W. E. Goode, J. C. Richardson, Dr. Kinmont (Hon. Sec.), and two visitors.

LAMBS FOR EXPORT.—Further discussion on this subject took place. It was agreed that lambs would have to be specially bred for export, and that, when a sufficient number were available for shipment, shipping facilities would be forthcoming.

RABBITS.—This pest has been rapidly gaining ascendancy of late in this district. Members are at variance as to the best means of getting rid of the rabbits.

SHOW.—Letter from Lipson Branch suggesting holding agricultural and live stock show was considered, and a committee appointed to co-operate with Lipson Branch with a view to deciding whether it was practicable to arrange for a show.

GENERAL SECRETARY.—Feeling reference was made to the resignation of Mr. Molineux, and great regret expressed that it should have been necessary to sever his connection with the Bureau. Members were unanimous in expressing their appreciation of the work done by Mr. Molineux.

Forest Range, June 23.

Present—Messrs. G. Monks (chair), J. Vickers, R. Green, A. Green, H. Green, R. E. Townsend, J. G. Rogers, H. Waters, F. Green (Hon. Sec.), and one visitor.

OFFICERS.—Retiring officers were thanked. Chairman re-elected, Mr. J. Vickers elected Vice-chairman, and Mr. F. Green Hon. Secretary.

CONFERENCE.—Decided to hold a conference of Hills Branches on October 16.

Wilson, June 21.

Present—Messrs. W. H. Neal (chair), W. H. Neal, jun., H. Ward, A. Crossman, H. T. Crossman, J. Coombs, D. Sexton, A. Smith (Hon. Sec.), and one visitor.

WHITE EYE IN CATTLE.—Several members reported that this disease is prevalent in the district. One member had left the affected animals untreated, and they recovered. Others had tried alum, salt, bluestone, and one had cured his animals within three weeks with alum,

Crystal Brook, June 21.

Present—Messrs. J. C. Symons (chair), H. Hutchison, G. M. Davison, P. Pavy, E. Dabinett, W. Hamlyn, W. J. Venning, and F. S. Keen (Hon. Sec.).

EXPERIMENTS.—Mr. Dabinett produced sketch plan of plot sown with grass and manures. Mr. Venning drilled them on June 14, and rain fell soon after.

RE-ORGANISATION OF BUREAU, &C.—Some remarks were made upon the policy just adopted by the Government; but it is not convenient to discuss such matters or to publish remarks, whether favorable or otherwise.—GEN. SEC.

Pyap, June 11.

Present—Messrs. W. C. Rogers (chair), C. Billett, F. Thiele, E. Robinson, J. F. Bankhead, and W. Axon (Hon. Sec.).

WHEAT FOR PIGS.—Members are of the opinion that it pays to feed pigs with wheat at the average price ruling.

WILD DOGS.—Dingoes are very numerous, and doing much damage amongst sheep and poultry.

Balaklava, June 14.

Present—Messrs. P. Anderson (chair), G. Reid, A. Manly, W. Smith, E. Hams, and E. M. Sage (Hon. Sec.).

PEACH-GROWING.—Mr. E. M. Sage read the following paper:—

The following remarks apply where the rainfall is at least 15in. annually. *Soil*.—The peach does best on a free soil with a substratum of limestone rubble; but, as far as I have seen, does not do well on either a stiff clay or a deep sand, where the apricot, with me, does best. It is a great mistake, but a very common one, to dig deep holes for tree-planting. I consider 9in. to 12in. as deep as is needful, but as large a surface may be moved as one feels inclined to do. Cultivate deeply as early as possible in the winter, letting in the rain to the subsoil, and in the spring scarify as often as possible, but not more than about 3in. deep, and so retain the moisture in the soil. The best kinds to plant in a dry climate are those that carry the fruit wood nearest to the older wood, as they can be pruned shorter, thereby keeping the tree more compact, and not having any surplus surface of leaf or limb to suffer from evaporation. I have had to work over several kinds that carried the fruit buds towards the ends of the shoots, as they never matured properly, but were always dry and undersized. I have one tree that I have left as an object lesson, both for myself and visitors, that has never borne a good marketable sample, whilst the kinds named below have always borne quite as good crops of a far better quality. The clingstones do not do here at all, being always dry and woody. The kinds I would recommend are Early Beatrice, Briggs' Red May, Early Rivers, Early Silver, Foster, Crawford, Lady Palmerston, and Salway, ripening in the order named. Early Beatrice is a small peach, very thin skinned, but first-rate flavor, and a very heavy bearer; does not drop the flower buds as a lot of the early peaches are apt to do. All peach trees carrying a heavy crop should be thinned, as quality of fruit should always be considered before numbers, and a fine well-grown peach is always much better flavored than a half-starved one. I prefer the peach worked on the hardshell almond, either bitter or sweet, but the soft shell will not do at all. The trees may not grow as freely as on the peach stock, but I have the same kind of peach (Early Silver) on both stocks side by side, and the trees worked on the almond stock beat the others both for quality and quantity of fruit; in fact, one dry season the fruit on the peach worked on peach were very poor in comparison with the peach on almond. Very few of my peaches are worked on peach, and I have more trouble with aphids on the few I have on peach than on nearly 200 on almond stock. When purchasing trees, get, if possible, trees only one year from bud, as they can be headed low, say 15in. to 18in. high, which is better than a high stem, and two-year old trees are generally shaped in the nursery to 2ft. or more and carefully disbudded below the head, so that it is almost impossible to work them back. Younger trees, too, have smaller roots, and so heal over quicker and better where they have been cut, which is a consideration where white ants are bad. In pruning, the primary object should be to shape and stiffen a young tree regardless of fruiting. When planting, prune to a straight stem not more than 18in. high, and during spring suppress all shoots but four or five at the top. Next winter leave, say, three of these in best position, pruning them back to about 6in. or 9in., and the next year leave two on each of these if you can get them in a good position

for shaping the tree. I think six to eight main arms are quite sufficient to have on a peach at any time, so that the third year I only leave about one on each of the previous season's arms, and leave a certain amount of fruiting wood, as a little fruit the third year will not hurt a peach tree. Prune all lateral growths by the fruit buds if they are plentiful and close to the older wood. I prune shorter than if they are scanty and situated further out. It must be borne in mind that the peach does not form what may be called permanent fruit spurs, but bears its fruit on last year's wood, and only once on the same wood. The great object should be to get a peach tree as full of vigorous young wood as possible if regular good crops are to be expected. I am not in favor of much summer pruning, as the growing season here is too short, and, if a shoot is pinched back, in some cases it does not start again, or, if it does, it makes only a few short spindly growths which are no good. I only look out for shoots that are growing where they are not wanted and suppress them altogether as early in the spring as possible. If a tree is growing too strong on one side a strip of bark taken out of half way round the limb that is running away from the others will check it, and is preferable to pinching back the top. Several members had failed in their attempts to grow fruit, but freely admitted that the Hon. Secretary had been quite successful.

Redhill, June 18.

Present—Messrs. D. Lithgow (chair), D. Steele, R. H. Siviour, R. T. Nicholls, W. Stone, H. E. Kelly, A. McDonald, J. N. Lithgow (Hon. Sec.), and one visitor.

BUREAU CONSTITUTION, &c.—Members do not favor increase of members or circulating library, and think that the Branches would be improved by a more regular attendance of members, and more young men on the roll.

Strathalbyn, June 16.

Present—Messrs. M. Rankine (chair), D. Gooch, W. J. Tucker, Geo. Sissons, R. Watt, J. H. W. Mules, W. M. Rankine, G. M. Meikle, G. J. Reid, J. Cheriton (Hon. Sec.), and one visitor.

COMMERCIAL FERTILISERS.—Chairman said he had used, experimentally, this season, 5lb., 10lb., and up to 20lb. muriate of potash along with super. on plots to ascertain whether his land is deficient in potash.

OFFICERS.—Officers thanked and re-elected. Next meeting, July 21.

Amyton, June 17.

Present—Messrs. Joseph Gum (chair), James Gray, John Gray, Alexander Gray, S. Thomas, and F. Mullett (Hon. Sec.).

OFFICERS, &c.—Chairman and Hon. Secretary thanked and re-elected. Mr. W. Mills Vice-chairman. Average attendance of nine members during year. Some of the members were unavoidably absent from the district three or four months.

EXHIBIT.—Mr. James Gray tabled a pumpkin weighing 50lbs., grown on land that had been flooded in winter, but had only one shower whilst the plant was growing.

PICKLING SEED WHEAT.—Mr. Alex. Gray read a paper on "Bunt and Pickling Seed" to the following effect:—

Although the majority of farmers pickle their seed, there are many who find much bunt in their crops, whilst a few who do not pickle claim practically an immunity from its attacks. The writer always pickles, and during twenty years has tried various pickling agencies, using the produce from self-sown seed, and conducting two years' trials with each pickle. Before pickling the seed was mixed with pulverised bunt balls.

Common Salt Pickle.—First year, 4 heads clean, 8 bunted; second year, 9 clean, 3 bunted.

Sea Water, 3hrs. pickling.—First year, 5 heads clean, 6 bunted; second year, 9 clean, 3 bunted.

Sulphuric Acid, 15 per cent. solution, half-hour pickling.—First year, 9 clean, 3 bunted; second year, all clean.

Bluestone.—Seed pickled usual way, sown before rain and after rain; results similar in both experiments. To show efficacy of bluestone, seed was contaminated with bunt, some pickled and sown, some sown not pickled. The unpickled seed, first year, had 1 clean stalk and 9 bunted; second year, 3 clean, 8 bunted. The whole of the pickled crop was clean. Unpickled seed came up two or three days before the pickled. Shrivelled seed pickled with a 12oz. solution per 4bush. bag with usual quantity of water had 15 per cent. destroyed by the pickle. A similar sample pickled in a weaker solution all germinated and ripened free of bunt. To ascertain the effect of broken grains, he halved good grains transversely, sowed the end containing the germ. An equal number of pickled and unpickled grains were sown. All grew, but the unpickled produced the strongest plants. Some of the good grains occasionally found in bunted heads were sown unpickled and grew stalks free of bunt. Seeds contaminated with black rust were sown unpickled, and produced plants affected with black rust. He concluded that it is not a sufficient safeguard to spread the seed on a floor, sprinkle with pickle, and turn the seed. Neither is immersion for thirty minutes in 8ozs. solution per bag. It is better to make a weaker solution and soak the seed until the bunt balls are pasty. Pickle weak and long.

Members approved of the principles enunciated, but do not all pickle when sowing on dry soil unless the seed is very dirty. When the soil is damp they always pickle before sowing. Drills should always be disinfected before sowing seed if the previous seed had been bunted. Bags and anything coming into contact with seed to be sown should be disinfected.

Angaston, June 21.

Present—Messrs. W. Sibley (chair), J. E. Swann, J. Rundle, S. O. Smith, R. Player, J. H. Snell, A. Friend, F. Solter, A. Salter, P. Radford, E. S. Matthews (Hon. Sec.), and one visitor.

CENTRAL BUREAU.—Members expressed appreciation of the "grand work done in the past by the Central Bureau," especially referring to such members as the Chairman (Mr. F. E. H. W. Krichauff), T. Hardy, and the General Secretary (Mr. A. Molineux), and regretted that the Minister of Agriculture should have deemed it to be necessary to dispense with their services.

WYANDOTTE FOWLS.—Mr. J. Rundle produced a pair of pure Wyandottes, which were much admired. He said they are great winter layers, the hen having produced forty-two eggs in seven weeks.

GUMERACHA CONFERENCE.—Members intend to do all in their power to make this useful and successful.

Minlaton, June 21.

Present—Messrs. Jas. Martin (chair), R. G. Newbold, J. Anderson, M. Twartz, H. Boundy, A. M. McKenzie, J. Bennett, D. G. Teichelmann, Jas. McKenzie (Hon. Sec.), and one visitor.

FERTILISERS.—Mr. McKenzie read a paper on this subject, dealing with the question of the condition of the bags and the quality of manure. He referred to the losses sustained by farmers owing to bags arriving in bad condition, sometimes necessitating re-bagging on the jetty or boat, as well as an actual loss of manure. This more particularly applied to the imported super., but the local guano super. this year arrived with bags in bad condition. He believed his loss this year was equal to 2cwts. to 3cwts. of manure, besides the extra expense and labor. Then in regard to quality; if the local works could supply super. containing, say, 75 per cent. water soluble phosphate, and let the farmers add sufficient bulk to make it run regularly through the drill,

there would be a great saving in bags, freight, &c. The farmer could add well-rotted sheep or fowl manure, or even stable manure, and by this means make better use of the manures produced on the farm. All members agreed in condemning the loss through broken bags, and would like to see some action taken to prevent this loss. Most members agreed that a higher grade super. would be cheaper in the end. Some members had mixed lime with super. with satisfactory results, but advised applying the manure as soon as possible after mixing. [The question of bags is very difficult to overcome; still it rests largely with the farmer, who should deal only with those who will undertake to deliver the manure in good condition. It is, however, to a large extent a matter of price; the merchant will probably raise his charges if he has to take larger risks. In regard to quality, cost also comes in here. To produce super. of 75 per cent. water soluble phosphate means double treatment and expense, and it is doubtful whether, when the extra labor involved in mixing it with sheep or other manure is taken into consideration, there would be much (if any) saving. There is besides the difficulty of getting a fairly even mixture, except at considerable labor, and also the possibility of the materials used causing the super. to revert. If, however, farmers were prepared to pay a proportionately higher price, the manufacturers would probably be able and willing to supply super. containing about 45 per cent. water soluble phosphate. Imported concentrated super., containing about 95 per cent. water soluble phosphate, can be obtained in Adelaide.—GEN. SEC.]

Paskeville, June 21.

Present—Messrs. A. Goodall (chair), J. P. Pontifex, J. C. Price, A. Palm, R. Hamilton, S. R. Price, and W. S. O'Grady (Hon. Sec.).

F.A.Q. SAMPLE.—It was resolved that this Branch is of opinion that it is desirable that the wheat-growing districts be divided according to climatic conditions, with a view to fixing a f.a.q. sample for each district as soon as samples of the new season's crop are available, thus enabling the corn trade section of the Chamber of Commerce to fix the standard earlier, and enable farmers who deliver their wheat early to get fair value for it. It was also decided that the Branches be asked to consider this resolution, with a view to having it further discussed at the Annual Congress.

THE GENERAL SECRETARY.—Great regret was expressed at the fact that Mr. Molineux had tendered his resignation as Secretary of the Agricultural Bureau. Members spoke in high terms of the services rendered by Mr. Molineux, and of the able manner in which he had carried on the Bureau and the *Journal of Agriculture*.

OFFICERS.—The Chairman and Hon. Secretary were thanked for their services and re-elected for ensuing year.

Saddleworth, June 13.

Present—Messrs. J. H. Frost (chair), D. H. Adams, W. H. Bee, T. H. Neill, George Bengier, and F. Coleman (Hon. Sec.).

USEFULNESS OF BUREAU.—Mr. Bee suggested associate members in addition to full members, to be provided with copies of *Journal* either at their own expense or that of the Branch as a whole, including associates. Further discussion adjourned.

Mount Compass, June 14.

Present—Messrs. M. Jacobs (chair), W. Gowling, R. Cameron, E. C. Good, F. McKinley, R. Peters, A. Sweetman, A. Bishop, J. Jenkins, F. Slater, A. J. Hancock (Hon. Sec.), and two visitors.

SEASONABLE HINTS.—During July sow carrots, parsnips, broad beans, beets, and mangolds; also tomatoes in boxes sheltered against frost.

APPLICATION OF LIME TO SOIL.—Mr. S. Malpas, a visitor, read the following:—

In the following paper I have endeavored to present briefly as many sides of this complicated question as possible. It is somewhat difficult to do this, and it is impossible to forecast the result of an application of lime to a soil with any degree of certainty. So little systematic research has been made, and so little is definitely known, that at present the available information relating to the subject presents a huge collection of facts which contradict each other strangely, and often speak as strongly against as for the practice of applying lime to soil. The reason of this appears to be that lime acts upon so many of the constituents of the soil, and these, varying in proportion in every soil, bring about results which are at times desirable and at times are very much the reverse. I have sought to make clear the action of lime on the separate constituents of the soil, so that from these you may draw your own conclusions according to the nature of the soil which you wish to treat.

In using the word "lime" as an agricultural term, it is understood always to mean quicklime, unless otherwise stated; so if a soil is said to contain 20 per cent. of lime, it means that if all the lime which exists in the soil were burnt, 20lbs. of quicklime would be obtained in every 100lbs. of earth. But at the same time the lime may actually be in the form of common limestone (calcium carbonate), or gypsum (calcium sulphate), or as calcium chloride, and combined with various silicates.

The analysis of the ashes of various plants shows that lime enters into their constitution in very small quantities. For example, in a crop of wheat, 18bush., 2,000lbs. straw, 6-7lbs. CaO; in a crop of peas, 12bush., 1,200lbs. straw, 28-29lbs. CaO; in a crop of potatoes, 120bush., 3,000lbs. tops, 20lbs. CaO. From these figures it may be seen that for a soil to contain enough lime to supply enough for the actual support of plant life, the percentage may be very small. A soil containing .01 per cent. would contain an abundant supply. But from another point of view a very much larger quantity is not only desirable but almost necessary for healthy vigorous growth. Therefore among authorities on agriculture, it is now considered not as a manure, but as an improvement or an amendment of soils.

The action of lime may be classed for convenience sake under three heads—

Physical—Bringing about changes in the state of the soil:

Chemical—Bringing about changes among the elements which constitute the soil:

Biological—Affecting the minute organisms which live in the soil and have so much to do with the health of the vegetation thereon.

Of the constituents of the soil which are physically affected by lime, clay and sand are the most important. They may, from a physical point of view, be regarded as opposites; and whereas lime binds one, it has the opposite effect on the other. As is well known, pure clay allows water to pass through it very slowly. The particles which make up the mass are so small, and lie so closely together, that when they are wet they form a mass which is not only well nigh impervious to water, but is extremely difficult to work, and obstinate when a fine tilth is required. Moreover, even if it be fairly worked up, a soil containing much clay runs together and sets with the first liberal rain.

The action of lime upon such clay may be readily demonstrated by stirring a small lump of clay into pure water. It will be seen that the water will remain muddy for days at a stretch, even if it is quite undisturbed. That is because the particles are too fine to sink. If a small piece of quicklime or a little little lime water be added, the particles flocculate together, and, thus becoming heavier, sink to the bottom. Thus in the soil lime makes clay flocculate into grains, leaving passages for the circulation of water, and destroying the adhesive property of it, so that it may be worked with comparative ease. On the other hand, when applied to sandy soils in suitable dressings, it acts in the same way in which the lime acts when added to a heap of gravel for concrete, or to sand for plaster; that is, it binds the particles together. So much for the physical action of lime.

The chemical actions are just as important, though more complicated, and therefore the results of its application are more difficult to forecast.

Lime taken straight from the kiln is in its most active state. The metal calcium, which is the base of all lime compounds, is combined with oxygen only. It is then most anxious to combine with water. Every particle of moisture in the air is taken up by it, and if water be added, it combines with it with great evolution of heat. It is then slacked lime, and will dissolve in water in small quantities.

Slaked lime is an alkali, which can best be explained as an opposite of an acid. These alkalis, being the opposites of acids, are ever ready to combine with them and form compounds or salts. So, if a little lime be added to some vinegar which contains acetic acid, the acid in the vinegar will combine with the lime and form one compound, nor can they be separated unless an acid which is stronger than vinegar can be brought to bear on it, so that it may turn the acetic acid out.

Now the first acid that comes in contact with lime is carbonic acid gas, or more correctly carbonic dioxide. It is present in the air we breathe, is dissolved in rain water, and exists all through soils in varying proportions. This at once combines with quick or slaked lime and makes calcium carbonate or common limestone.

To demonstrate this, dissolve a small lump of quicklime in water, and when the water has cleared blow with a straw through it. It will immediately become milky. That is the carbonic acid gas of the breath has combined with the lime held in solution and formed calcium carbonate, which being insoluble will in time sink to the bottom.

Although carbon dioxide readily combines with lime there are plenty of stronger acids which will readily turn it out. Pour a little vinegar on some common limestone or marble and it will at once bubble up. That is the gas being driven off.

There is another reaction which may take place. Lime combined with an acid may come in contact with another base combined with another acid, and the acids may change places. Thus, if calcium sulphate come in contact with sodium carbonate a reaction takes place, and the result is calcium carbonate and sodium sulphate.

This is often taken advantage of in the case of soils which are practically poisoned with sodium carbonate, this salt being difficult to remove, whereas sodium sulphate readily washes out of the soil.

These examples will, I think, be sufficient to explain some of the chemical effects of lime in the soil, which I shall now enumerate.

In the first place it decomposes silicates. These are made up of silica and such bases as potash, magnesium, sodium, &c., &c.

Nearly all the silicates contained in the soil are insoluble, so that the roots of plants are unable to take advantage of them. If the lime (and in this case quicklime is the most active) comes in contact with these silicates it sets free the potash and takes its place. The potash combines with the acids of the soil—generally carbon dioxide—and is made available for plant food. Not only does it set free potash, but by bringing about its conversion into a carbonate it enables the surface layers of soil to retain it, whereas if it existed in the form of a sulphate or a chloride it would quickly be leached out by the rain soaking down into the subsoil. It also has the same effect on ammonia—converting it into a carbonate, and so fixing it in the surface layers of soil.

We come now to the action of lime on the organic matter in the soil. All decaying vegetable and animal matter in the soil supplies plant food. Its breaking up is brought about to a great extent by microbes. After setting free the potash and phosphoric acid, there still remains the humus. Although humus contains an abundance of plant food, it is not available to the plants without decomposition. Neither is it absolutely necessary that a soil should contain humus in order that it may support plant life. It is, however, of immense value physically. It tends to make both sand and clay of a loamy nature, and retains potassium and ammonium carbonates in the surface layers of the soil. It retains moisture in the soil, and sets free carbon dioxide by its own decomposition, which helps to hold plant food in solution. It is due to this decomposition of humus that so much of its nutriment is placed at the disposal of plants. Lime, coming in contact with organic matter, breaks it down, and assists its decomposition. It also assists the ferments working in the humus. So long as it is not too strong, the fact of the soil being made alkaline with lime makes it a much more favorable medium for the development and action of ferments than if the soil were acid. Now, the result of fermentation is the setting free of various weak acids, such as humic acid, and stronger acids, such as nitric and nitrous acids. If these acids accumulate and remain free in the soil they ultimately kill the ferments which produce them; but if lime is present it absorbs the acids as fast as they are produced, and allows the ferments to work on in peace.

It is most important that the nitric ferment should have free play, because in the form of nitrates the higher orders of plants absorb their nitrogen. Thus it is possible to have a soil rich in organic nitrogen but comparatively barren.

Another aspect of lime, both in clay, sandy soils, or soils containing humus, is that it by chemical action fixes substances in the soil.

Potassium and ammonium carbonates have already been mentioned.

Experiments have been carried out showing that while dung liquor will pass through pure sand unchanged, if a small percentage of lime be added to the sand the liquor will pass through and leave all the organic matter in the sand, which would have otherwise remained barren and useless.

Also in clay it allows the free percolation of water. The result of this is most important from a chemical point of view. Clays as a rule are rich in potash, and the lime and water containing carbon dioxide passing through it sets it free. Not only that, but it allows of the admission of humic acid into the clay. This induces the clay to become more friable, to mix with sand and form a loam.

Heavy dressings of lime on sour water-logged land, which only grows poor sedgy grasses, will sweeten the land and induce the growth of more delicate and nutritious herbage. The value of lime from a biological point of view has been unavoidably touched upon in the foregoing. While a slight alkalinity of the soil is advantageous for the development of bacteria, heavy dressings will for the time check them altogether. This is done in districts where large crops of turnips are grown. The turnip is subject to a fungus which induces "finger and toe" disease. It has been found that a liberal dressing of lime will reduce its ravages to a very large extent.

It has been noticed that lime, in common with wood ashes, favors the growth of potato scab. Sugar beets also, if affected with scab, suffered to a greater extent on limed land.—"But since in acid soils, such as are common in New England, liming the land increased not only the yield of the potatoes, but the percentage of large-sized tubers, it may well be true that the use of lime might be economically advantageous in case only one crop of potatoes was to be grown, for the effects of the scab are not usually serious in the first year, provided the seed potatoes are free from scab or have been freed from it by the use of corrosive sublimate."—(STORER.)

The foregoing I think fairly reviews the various functions of lime in soils, and it only remains to make a brief summary of the various methods of application in countries where its use is extensive, regular, and of proved benefit to the producers.

Storer gives the following:—"More than 5-6 tons to the acre are now seldom used even on strong land. Instead of applying 4-8 tons once in 15-19 years on land that has been previously limed, the rule now is to apply lime every 6-8 years in quantities not larger than 1-2 tons to the acre."

In reclaiming peaty land, 2-3 tons to the acre may be applied after the land has been drained, and if profit is got from these dressings, still larger may be tried. Lime is used on land recently broken up and on peaty soils as a dressing for club-root and "finger and toe" disease. Some land requires 80 bush. of lime every 8-12 years in order that roots can be grown upon it with any certainty.

For the methods of applying lime, I gather from numerous accounts that the following is the most general, and one that, with a little judicious modification, will suit most conditions:—The fresh lime from the kiln is laid in heaps on the field, at convenient distances for spreading, and covered with damp soil until it becomes a fine dry powder. Usually twenty-four hours is sufficient for this to take place. It is then spread and harrowed in at once. When once the lime is taken from the kiln no time should be wasted.

I add another extract from "Storer" with reference to the use of lime in making peat composts:—"For every 100 bush. of peat take 10 bush. of quicklime, to be slaked just before use with a solution of common salt, or probably better still, with a solution of muriate of potash. The peat and lime are mixed by spreading them in layers, the whole built up into a compact heap 3 ft. or 4 ft. high. The heap may then be drenched with water, unless the peat is already fairly moist. Stable litter may be added with profit. Such a heap should be reduced to a good compost in four or five month's time."

Booleroo Centre, June 23.

Present—Messrs. W. Michael (chair), J. Arthur, D. Steven, N. Clack, J. Clack, W. Brooks, J. Murdoch, W. N. Nottle, J. Albinus, F. McMartin (Hon. Sec.), and one visitor.

OFFICERS—Retiring officers thanked. Mr. W. H. Nottle elected Chairman, Mr. N. Clack Vice-chairman, Mr. F. McMartin re-elected Hon. Secretary.

Pres.—Mr. Murdoch read a paper giving his forty years' experience of pigs. The favorite pig in his earlier days was the short-nosed Yorkshire, which often weighed 210 lbs. at six months of age, though they were usually killed when a year old, when they weighed 300 lbs. to 400 lbs. Up till about twenty years ago the pigs of this State were of all sorts but no breed, and some of the worst that he had ever seen. Messrs. Umpherston (Noarlunga), Rake, Smith, Davenport, Angas, Hart, and one or two others were to be credited with importing pure-bred pigs of various breeds. After trying several breeds, he had

come to the conclusion that the pure Berkshire was the best and most profitable pig—strong, healthy, and thrifty—putting on more meat than any other pig will for the same quantity of feed. He had tried the cross of Berkshire on Essex, and preferred the pure Berks., although the cross was very good. Mr. Clack said he had a crossbred Berks. and Essex pig ten months old that will weigh 200lbs. Mr. Arthur said he had a Berkshire twelve months old which weighed 500lbs. The Berkshires would eat all the live poultry they could catch.

Mylor, June 31.

Present—Messrs. W. J. Narroway (chair), J. Nicholls, J. Roebuck, W. H. Hughes, W. Nicholls, P. P. Probert, T. J. Mundy, W. G. Clough (Hon. Sec.), and three visitors.

OFFICERS.—Retiring officers thanked, Mr. Wm. Nicholls elected Chairman, J. Smith and C. Nielsen, Vice-chairmen.

ANNUAL REPORT.—Eleven meetings held during the past year; average attendance, 8.5; nine papers read; and many samples of products tabled. The annual Conference of Hills Branches was held at Mylor last time, and was the most successful yet holden. The Mylor Co-operative Society, started by this Branch, has been very successful.



SOUTH AUSTRALIAN RAILWAYS.

Parcels and Passengers' Luggage.

COLLECTION AND DELIVERY AT ADELAIDE, PORT ADELAIDE,
AND GLENELG.

The attention of passengers is called to the fact that the Railway Department collects and delivers all parcels and luggage in Adelaide, Port Adelaide, and Glenelg, or in the suburbs mentioned below, thus avoiding inconvenience and loss of time to passengers. Such parcels and luggage will not, however, be accepted for delivery on board any vessel lying at Port Adelaide, but passengers claiming their luggage at that station can have it carted to the wharves or sheds where vessels are loading.

The charges for collection or delivery are as follows :—	In Adelaide, Port Adelaide, or Glenelg.	To or from any of the undermentioned Suburbs.
	s. d.	s. d.
<i>* Luggage.</i>		
For each package not exceeding 28lbs.	0 3	0 6
For each package exceeding 28lbs., but not exceeding 112lbs.	0 6	1 0
For every additional 112lbs., or part thereof, per package ..	0 6	1 0
<i>Parcels.</i>		
For each parcel not exceeding 14lbs. in weight	0 3	0 6
For each parcel exceeding 14lbs. but not exceeding 56lbs. ..	0 6	1 0
For every additional 56lbs., or part thereof, per package	0 6	1 0

* Charges to be made on the aggregate weight when luggage belongs to one person.

Delivery carts leave the Adelaide Station on week-days at 9 a.m., 11 a.m., 2 p.m., and 4.30 p.m., for delivery within the municipal boundary of Adelaide; and for delivery in the suburbs at 2.15 p.m.; at Port Adelaide as often as may be required between the hours of 8.0 a.m. and 6.0 p.m.

Special attention will be given to this service in order to ensure prompt and safe delivery. Unless parcels received in Adelaide and Port Adelaide are addressed "To be left till called for," the Department will deliver at above rates.

Suburbs to which the Collection and Delivery Service Extends.

Adelaide Municipality—Clarence Park, College Park, College Town, Eastwood, East Adelaide, Frewville, Gilberton, Goodwood, Hackney, Hyde Park, Hilton, Kenilworth, Kensington, Keswick, Kent Town, Malvern, Medindie, Mile End, Norwood, Parkside, Portland, Prospect, Rose Park, Rosewater, Stepney, Southwark, Thebarton, Unley, Unley Park, Victoria Park, Walkerville.

Port Adelaide Municipality—Birkenhead.

Glenelg—Somerton.

Notice to Passengers.

If you require your luggage delivered by the Department, either in Adelaide, Port Adelaide, or in any of the above-mentioned suburbs, have it fully addressed, and hand it to the stationmaster at the station where you begin your journey, who will arrange to forward it.

PARCELS RATES.

Any distance not exceeding—	Weight not exceeding						For each additional 14lbs. or part thereof.
	7lbs.	14lbs.	28lbs.	56lbs.	84lbs.	112lbs.	
10 miles	s. d. 0 6	s. d. 0 6	s. d. 0 6	s. d. 0 8	s. d. 1 0	s. d. 1 4	s. d. 0 2
20 "	0 6	0 6	0 6	1 0	1 6	2 0	0 3
40 "	0 6	0 6	0 8	1 4	2 0	2 8	0 4
60 "	0 6	0 6	0 10	1 8	2 6	3 4	0 5
80 "	0 6	0 6	1 0	2 0	3 0	4 0	0 6
100 "	0 6	0 7	1 2	2 4	3 6	4 8	0 7
140 "	0 6	0 8	1 4	2 8	4 0	5 4	0 8
180 "	0 6	0 9	1 6	3 0	4 6	6 0	0 9
220 "	0 6	0 10	1 8	3 4	5 0	6 8	0 10
260 "	0 6	0 11	1 10	3 8	5 6	7 4	0 11
300 "	0 6	1 0	2 0	4 0	6 0	8 0	1 0
For each additional 50 miles or part thereof }	—	0 1	0 2	0 4	0 6	0 8	0 1

When two or more parcels are consigned to one person the above rates are charged on each parcel separately.

Parcels addressed "Murray Street Terminus, Gawler," "To be called for," may be booked at station to station rates.

Fresh meat, butcher's small goods, and fresh fish (when in baskets or boxes, or packed in bagging or calico), butter, eggs, dead poultry, game, mushrooms, cut flowers, ice in boxes or bags, and South Australian fresh fruit are carried at half parcel rates; minimum charge 6d. This applies also over Silverton Tramway. Unless such packages are marked "Till called for" they will be delivered in Adelaide and Port Adelaide at the following rates:—Not exceeding 14lbs., 3d.; not exceeding 56lbs., 6d.; not exceeding 112lbs., 9d.; not exceeding 224lbs., 1s. 3d.; not exceeding 336lbs., 1s. 9d.; for each subsequent 112lbs., or part thereof, 3d. The South Australian rail and delivery charges are to be calculated on the aggregate weight of each consignment, and the latter charges must be doubled for delivery outside the city but within a radius of two miles of the General Post Office.

All fish, fruit, meat, poultry, and other perishable articles are conveyed at owners' risk, and are liable to immediate sale if not claimed and charges paid on arrival.

Packed parcels in hampers, crates, bags, cases, or other packages are charged quadruple parcel rates, and the onus of proving that the parcels are not packed rests with the consignees or consignors.

The Railways Commissioner will not be accountable for any parcel above the value of £5, unless the nature and value of the articles or property contained in such parcel shall have been declared by the sender, and an insurance rate equal to 1 per centum upon such declared value shall have been paid, in addition to the amount chargeable by the foregoing scale of rates.

Feathers, furniture, glass, hats, bonnet and hat boxes, cases of millinery, straw bonnets, mirrors, musical instruments, sulkies in pieces, pictures, sewing-machines, wickerwork, wire cages, or other articles light or fragile, are charged 50 per cent. above parcels rate (Port and Glenelg lines excepted).

Returned empties, actual weight, single rate, must be prepaid.

Parcels which are intended to be booked by any particular train must be delivered at the forwarding station at least fifteen minutes previous to its departure; otherwise they may be detained until the departure of the following train.

Parcels waybilled, and addressed "To be left till called for" at the chief stations, will, if not called for within forty-eight hours thereafter, be subject to the same charges and regulations as left luggage.

The Railways Commissioner will not be responsible for the loss of, or damage to, any goods or parcels addressed "To be left till called for."

No live small animal or bird will be received for carriage by railway unless confined in a proper coop or case, and the stationmasters and guards will be authorised to refuse any coop or case which, in their judgment, is too small for the purpose to which it is put, or, being fit, is so overcrowded as to cause needless suffering to the birds or animals it contains.

PARCELS FOR OCEAN STEAMERS.

For an additional charge of 1s. for each 56lbs., or part thereof, parcels will be placed on board ocean steamers at Largs Bay.

CREAM AND MILK.

These will be carried, at owners' risk only, in the brake-vans of passenger trains at the rates and subject to the conditions following:—

Not exceeding 25 miles	$\frac{1}{2}$ d. per gallon
For each additional 25 miles, or part thereof	$\frac{1}{2}$ d. "
Minimum charge	6d.

Skimmed milk from butter and cheese factories, to which it has previously been carried by rail as fresh milk:—

Not exceeding 25 miles	$\frac{1}{2}$ d. per gallon
For each additional 25 miles, or part thereof	$\frac{1}{2}$ d. "
Minimum charge	3d. "

Cream and milk will only be received in properly constructed drums, which must be quite water-tight. Each drum must be impressed with its capacity in gallons, and with the names of the owner and station.

The charge will be made upon the capacity impressed upon the drum.

Empty return drums, 1d. for each consignment of 28lbs. or part thereof for each 100 miles or part thereof.

COOL CHAMBERS.

During the hot season cool chambers run as under:—

Between Adelaide and Broken Hill.

From Adelaide on Tuesdays and Thursdays, at 5·30 a.m.
From Broken Hill on Wednesdays and Fridays, at 8·10 a.m.

Between Port Pirie and Broken Hill.

From Port Pirie on Mondays and Thursdays, at 6·50 a.m.
From Broken Hill on Tuesdays and Fridays, at 8·10 a.m.

Between Adelaide and Quorn.

From Quorn on Mondays and Thursdays, at 8·18 a.m.

Between Adelaide and Moonta.

From Adelaide on Wednesdays and Mondays, at 7·40 a.m.
From Moonta on Thursdays and Tuesdays, at 6·25 a.m.

Between Adelaide and Port Pirie via Blyth.

From Adelaide on Tuesdays and Fridays, at 5·30 a.m.
From Port Pirie on Thursdays and Mondays, at 9·28 a.m.

Between Adelaide and Mount Gambier.

From Mount Gambier on Tuesdays and Thursdays, at 7 a.m.

Between Adelaide and Eudunda.

From Adelaide on Wednesdays and Saturdays, at 11.50 a.m.

From Eudunda on Thursdays and Mondays, at 10.20 a.m.

Between Adelaide and Milang.

From Adelaide on Mondays and Thursdays, at 7.30 a.m.

From Milang on the same days, at 2.40 p.m.

From Quorn to Hergott Springs.

On each Saturday, at 8.34 a.m.

Packages of butter only will be received for conveyance by these chambers, but must be so marked.

Goods forwarded in the cool chambers will be charged half parcels rates, minimum 6d.

DELIVERY CHARGES, FREEZING DEPOT, PORT ADELAIDE.

On packages sent by passenger train:—

For each consignment not exceeding	14lbs.	.....	3d.
" " "	56lbs.	.....	6d.
" " "	112lbs.	.....	9d.
" " "	224lbs.	.....	1s. 3d.
" " "	336lbs.	.....	1s. 9d.

Each subsequent 112lbs. or part thereof..... 3d.

Carriage and delivery charge must be prepaid.

PARCELS DELIVERY, COUNTRY TOWNS.

Parcels, *unless* directed "*To be left till called for*," will be delivered within the municipal boundaries of Gawler, Kapunda, Port Augusta, Wallaroo, and Moonta at the following rates:—Parcels up to 112lbs., 6d.; above 112lbs. and not exceeding 196lbs., 1s.; above 196lbs., 1s. 6d.; Mount Gambier, irrespective of weight, 3d.



INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

Number of Persons Registered and Found Employment by Government Departments and Private Employers from May 28 to June 30, 1902.

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youths	160	224	385
Masons and bricklayers	1	—	1
Stonecutters	2	—	2
Carpenters	8	1	1
Painters	11	—	4
Plumbers and ironworkers	2	—	2
Enginedrivers and firemen	1	—	—
Fitters and turners	1	—	2
Boilermakers and assistants	5	—	1
Blacksmiths and strikers	9	—	—
Framemakers	—	—	1
Diver	—	—	1
Cook	—	—	2
Brassmoulder	—	1	1
Apprentices	13	1	—
Cleaners	6	4	—
Porters and junior porters	17	6	—
Rivet boys	1	—	1
Totals	237	237	404

July 2, 1902.

A. RICHARDSON, Bureau Clerk.



I. A. R. I. 75.

IMPERIAL AGRICULTURAL RESEARCH
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